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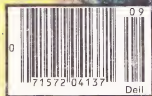
Larry Niven • David Friedman • Timothy Ferris

Galileo

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ON THE YOUTH OF APOLLO 11



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Magazine of Science and Fiction
is published bimonthly in January, March, May
July, September, and November, at 339 Newbury
Street, Boston, Massachusetts 02115. Single copy
price: \$1.95. Subscriptions: \$7.50 for 6 issues, \$12
for 12 issues. This issue published September, 1979.
All characters and settings contained in stories are
purely fiction. The factual accuracy of non-fiction
articles is the responsibility of the author. No
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ABOUT OUR COVER

Werbel or Wookie, Kelly Freas has the
knack of capturing their humor on
canvas. On this issue's cover, he has
snatched two memorable scenes from
"The Court of the Timesifters" by Mary
Schaub.

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Pro-File

Letty Hummel

Clockwise from upper left: Connie Willis, D.C. Poyer, Lin Poyer, Sandra Miesel, Larry Niven, Kelly Freas, Mary Schaub.

Photo Credit: F.A. Crawford



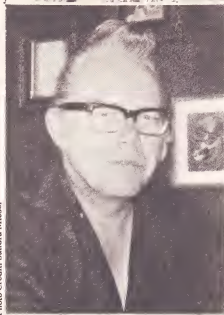
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IS THE SPACE adventure justified? The scientists have their say in Part II of *Galileo's* symposium, "On the 10th of Apollo 11," commemorating the anniversary of the first moon landing, and exploring the pros and cons of conquering space in five essays that are no less informative than they are provocative.

Astronomer **F.D. Drake** gazes into his celestial crystal ball to offer some startling prophecies about man's future in space. As an associate astronomer at the National Radio Astronomy Observatory in Green Bank, West Virginia, Dr. Drake directed Project Ozma, the first attempt in history to make contact with extraterrestrial life. Known as the discoverer of the Jupiter radiation belt, Dr. Drake is the author of *Intelligent Life In Space*, which details the technical developments behind the possibility of extraterrestrial communication. Presently, Dr. Drake lives in Ithaca, N.Y., where he is the Director of the National Astronomy and Ionosphere Center at Cornell University, which includes the world's largest radio telescope at Arecibo, Puerto Rico.

In this issue's essay, science writer **Timothy Ferris** places the impetus for space exploration in its historical context. Mr. Ferris is the author of *The Red Limit: The Search For The Edge Of The Universe*, published by William Morrow in 1977. A book about major discoveries in cosmology and astronomy, the title *The Red Limit* refers to the fact that light waves from a receding galaxy shift toward the red end of the spectrum, a finding that led to the discovery that the universe is expanding. A 1966 graduate of Northwestern University, he has worked for UPI, the New York Post, and as New York bureau chief for *Rolling Stone*. His

Photo Credit: Sandra Miesel



science articles have appeared in *Esquire*, *Playboy*, *Harper's*, *New Times*, and *Rolling Stone*. Mr. Ferris is now teaching journalism at Brooklyn College.

In his brief but cogent remarks, social scientist **David Riesman** reminds us that not everyone celebrated man's first moon landing. A versatile scholar with an undergraduate and law degree from Harvard, Mr. Riesman has taught social science at the University of Chicago and directed research projects for the Committee on National Policy at Yale. He has co-authored numerous books, but is perhaps most famous for his classic study of the social character of middle-class America published in the bestselling book, *The Lonely Crowd*. He is now Henry Ford II Professor of Social Sciences at Harvard and a member of the Carnegie Commission on Higher Education.

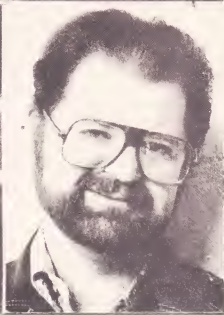


Photo Credit: Charles Ryan

Astronomer **Fred L. Whipple** is a science fiction enthusiast who has been involved with the man-made satellite project since the 1950s. He says that a manned-space program can have only one purpose—the colonization of space. A professor of astronomy at Harvard, Dr. Whipple has been the Director of the Smithsonian Astrophysical Observatory in Cambridge, Massachusetts, since 1955. Whipple, who developed a theory on the nature of comets, independently discovered six new comets. Known as the inventor of the optical tracking system used to follow the movements of Earth satellites, he is the author of *Earth, Moon, and Planets*. He received the President's Award for Distinguished Federal Civilian Service in 1963.

Dr. Robert L. Forward is a Senior Scientist in the Exploratory Studies Department of Hughes Research La-

Authors

laboratories in Malibu, California. A science fiction partisan and champion of the space program, Dr. Forward is getting impatient waiting for the next manned-space expedition. Known as a pioneer in the gravitational radiation astronomy field, he is the inventor of the Rotating Gravitational Mass Sensor used to map the earth and planets from aircraft and spacecraft. He also participated in the construction of the first detector for interstellar gravitational radiation, now on display in the Smithsonian Museum. Dr. Forward maintains and publishes a bibliography on Interstellar Communication and Travel that now numbers over 1200 entries. By the way, the cartoons in this issue were done by Dr. Forward's son, Bob.

The second installment of **Larry Niven's** *The Ringworld Engineers* finds Louis Wu and Speaker to Animals in a life and death struggle on the Ringworld. Considered one of the most popular writers of the day, Niven is said to have started writing science fiction for the fun of it. Followers of the famous SF writing team take note: Niven is at work on yet another collaboration with Jerry Pournelle. This time the authors of the bestselling *Lucifer's Hammer* are writing about an arcology (Paoli Soleri's term for a self-sufficient urban structure) tentatively titled *The Oath Of Fealty*. Mr. Niven lives in Tarzana, California with his wife Marilyn Wisowaty, where they are both active in the Georgeette Heyer Society. What attracts a science fiction writer to historical fiction fandom? A *Pro-file* secret source says that the period details of Miss Heyer's Regency novels have all the magical lure of an alien world.

During a trip home to Pennsylvania at Christmas, the brother and sister team D.C. and **Lin Poyer**, who share an interest in SF, found themselves talking about what anthropologists know about trade relations between peoples. They extended that discussion to include future trade relations between species and the result is this issue's story, "Silent Trade." *Galileo* readers are familiar with D.C., a Norfolk-based freelance writer, who makes his fourth appearance in *Galileo* with this story. Lin is a 25-year-old graduate student in anthropology at the University of Michigan. "By the time you read this," she says, "I'll probably be in Honolulu, on my way to Micronesia to begin ethnographic fieldwork on my Ph.D." D.C. says he is now looking for a publisher for an SF adventure novel he describes as "a biological underwater 67,000-worder with aliens and plagues and intelligent sharks."

The publication of "The Court of the Timesifters," the subject of our Kelly Freas cover illustration, marks **Mary H. Schaub's** first appearance in *Galileo*.

Authors

The author's inspiration for this enchanting story can be traced to her fondness for a touch of humor in SF. Ms. Schaub came across Andre Norton's *Star Rangers* in the eighth grade and has been reading in the field ever since. She says that her memberships in the National Space Institute, the Cousteau Society, and the Society for Creative Anachronism are expressions of her concerns for the future of space exploration, the health of the oceans, and the survival of what was admirable in medieval society. A life-long resident of Apex, North Carolina, she is currently working on her first SF novel.

A family trip to Lewiston, Montana to watch last February's solar eclipse provided the inspiration for the **Connie Willis** story, "And Come From Miles Around." Ms. Willis says of her story, "It is my cherished opinion that mothers of toddlers, while cut off from the mainstream of life by frequent trips to the bathroom, are in a unique position to see things other people might miss, especially if everyone else is concentrating on the sky." Ms. Willis says her future plans include writing a story about the London blitz that will feature St. Paul's Cathedral, which she visited last summer on a trip to England.

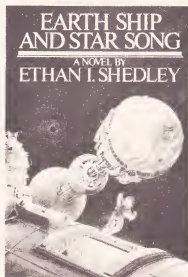
Sandra Miesel, whose candid article on Kelly Freas owes something to the fact that they are good friends, is an artist in her own right. She was the official NASA artist at the ASTP launch in 1975 and examples of her needlework are part of the permanent collection in the National Air and Space Museum. Reading "Case of Conscience" by James Blish hooked her on SF at age 11; she and her husband have been fans since 1967. She likes to jest that she married her husband "to get my hands on his SF collection." A specialist in the religious and mythological aspects of SF, her essays and critical articles have appeared in popular and scholarly publications in the U.S., Canada, England, and France. Ms. Miesel, who has been nominated three times for Hugo Awards as Best Fanwriter, lives in Indianapolis with her husband, a research chemist, and their three children.

Susan Lull, author of "I Demand The Stars For My Children!," admits that every story contains a portion of autobiography. Though she was born in the year the Wright brothers first flew, it was a warm August day in upper New York state, not the bleak scene described in the story. However, she really did go canoeing in the Finger Lakes as a Girl Scout and did fly in one of the first Curtis trainers as a 14-year-old girl. And she really does have a son, Robert, who missed getting an experiment on the never-to-be Apollo XVIII. —G—

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Editorial

"Progress or defeatism. It's our choice;
it's their destiny."

—David Egge.



David Egge

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The Faded Sun: Kesrith
by C. J. Cherry
The White Dragon
by Anne McCaffrey
Dreamsnake
by Vonda N. McIntyre
Blind Voices
by Tom Reamy
Up the Walls of the World
by James Tiptree, Jr.

BEST NOVELLA

"Enemies of the System"
by Brian Aldiss
"The Watched"
by Christopher Priest
"The Persistence of Vision"

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by John Varley
"Fireship"
by Joan D. Vinge
"Seven American Nights"
by Gene Wolfe

BEST NOVELETTE

"Hunter's Moon"
by Poul Anderson
"Mikal's Songbird"
by Orson Scott Card
"The Man Who Had No Idea"
by Thomas M. Disch
"Devil You Don't Know"
by Dean Ing
"The Barbie Murders"
by John Varley

BEST SHORT STORY

"Stone"
by Ed Bryant
"Cassandra"
by C.J. Cherry

"Count the Clock That Tells the Time"
by Harlan Ellison
"View From A Height"
by Joan D. Vinge
"The Very Slow Time Machine"
by Ian Watson

CAMPBELL AWARD

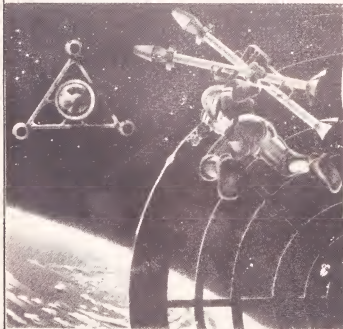
Galileo extends its heartiest congratulations to the bright new writers who have been nominated this year for the John W. Campbell Award. They are Stephen Donaldson (*The Chronicles of Thomas Covenant the Unbeliever*), Elizabeth Lynn (*A Different Light*), Charles Sheffield (*Sight of Proteus*), and finally, two authors who have had work in *Galileo*: Cynthia Felice, whose first story "Longshanks" appeared in *Galileo* #2 (*Godsfire*) and James P. Hogan, whose article "Think of a Number" appeared in *Galileo* #9 (*Inherit the Stars*).

Editorial

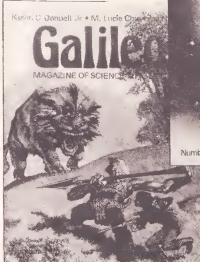
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finest artists in the field titillate the imagination. But the best parts are the stories, where science becomes the future, by such authors as Harlan Ellison, Marion Zimmer Bradley, and Jack Williamson. Great novels like Larry Niven's long-awaited sequel *THE RINGWORLD ENGINEERS* are serialized complete and uncut. From pathos to adventure, from the horrific to visions of the ideal, it's yours.



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The Artist In His Studio: Frank Kelly Freas

Sandra Miesel

Opposite: "Moment of Truth," cover painting for Confederation Matador by J.F. Bone, the first book in the Starblaze series, edited by Polly and Kelly Freas.

Below: "The Telzey Toy," DAW Books, 1973.

Page 12: From "Brandyjack," Laser Books, 1973.

WHETHER IT means confronting a goat or cruising on a nuclear submarine, Frank Kelly Freas will do whatever is necessary to produce effective science fiction illustrations. This dedication expresses the ten-time Hugo Award winner's confidence in the importance of his profession. "It's all right to question your own ability to express the idea," observes Freas, "but when an artist questions the value of what he has to say, he hasn't anything to say." Worthwhile pictures are the fruit of firm convictions.

Among Freas's own convictions are beliefs in the value of illustration and in the legitimacy of commercial art. An illustrator is first of all an adept fine artist "but his work begins where his play as an easel painter ends." He denies any automatic superiority of status to fine art. This species is now chiefly defined by its uselessness although the admired works of other ages were purposeful creations which expressed the concerns of their societies. "Self-expression is unquestionably good psychotherapy—but there its significance stops." Artists should not be solipsists. Illustrators cannot be.

Illustrators are distinguished from other artists by "a desire, which eventually becomes an ability, to dig into and drag out of the subject aspects, moods, relationships, nuances which are absolutely *not* expressible in words." They make their audience ask questions (why does a crossbow coexist with a high-energy artillery piece in "The Miracle Workers"? How were those glassy battlements constructed? Who—or what—is wearing that garish costume?) and summarize their emotional experiences (desire in "Zenya," trust in "The Gulf Between"). Illustrators function by expanding and focusing

their viewers' minds.

Freas strives to create mind-expanding and mind-focusing science fiction illustrations that will be both aesthetically pleasing and commercially useful. The following descriptions of his working methods are necessarily schematic. Each assignment is unique. The artist tries to avoid stereotyped routines lest he hobble his imagination.

First catch your rabbit; first catch your manuscript. At the beginning of a career getting work can be more difficult than doing it. The first portfolio Freas submitted to editor John Campbell was a masterpiece of neophyte pretension consisting of expensively contrived mockups of *Astounding* pages. It was returned to him scorched by Campbell's wrath. Only after several humbling years in the pulps (when trainfare to a magazine office often equalled the fee earned there) did he





dare approach Campbell again. This meeting soon led to his first *ASF* cover, "The Gulf Between" (1953), which Freas still counts among his special favorites. The painting shows a giant robot beseeching Someone to heal the mortally injured human he holds in his hand. This somber and innovative illustration ignited the artist's career in SF.

Over the past decades Freas has worked with every breed of editor: experienced ones able to propose illustrations and those whose notions of SF were shaped entirely by Japanese monster movies; those who leave everything to the artist's own initiative and those who leave nothing; ones who specify the exact quantities of nuts, bolts, and bubbles on a gadget and others more concerned about the number of sequins on a costume.

As a joke Freas once sent one of his more restrictive clients a preliminary sketch featuring a totally nude girl. (A few spangles painted on an acetate overlay sheet only compounded the scandal.) After the shrieks subsided, he dutifully clothed the heroine in a skintight garment on the finished cover—just as he had intended to do all the while. The usual compromise in such cases is a judicious pose. This approach can be more titillating than actual nudity as in the "Ambassadors of

Flesh" cover from *Planet Stories*.

In addition to the editor, an illustrator also has to satisfy the art director. His challenge is to reconcile the demands of a verbal (but non-visual) party with those of a visual (but non-verbal) one. Currently, Freas combines the functions of editor, art director, and illustrator for the Starblaze series published by the Donning Company and strikes his own harmony with himself.

Whether destined for his own publisher or for others, each assignment begins with thorough preparation. Once a manuscript arrives in the mail, Freas reads it. (Most SF artists do the same but other kinds of commercial illustrators often work from a page of specifications rather than a text.) His wife Polly reads the story, too, and they discuss it. Then he re-reads it with a critical eye, searching for potential illustration subjects. His notebooks contain such entries as a sketch of two figures standing on riveted steel plates or the scribbled comment: "Frog-like robot comes through iris-door in wall." He also takes down descriptions of major characters and settings.

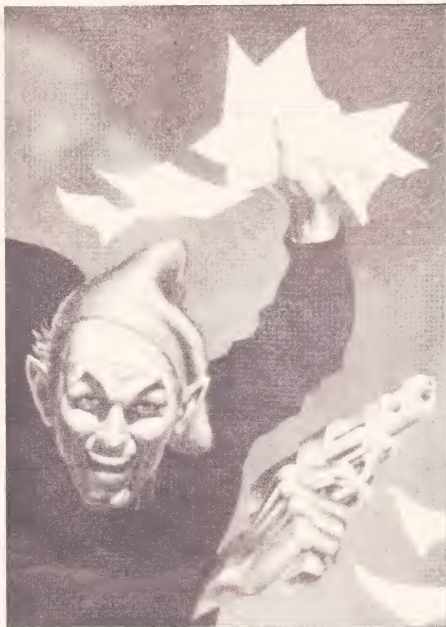
Sometimes the subject is so obvious no search is necessary. The problem is to find the best way of presenting it. For example, the "Hero" cover had to feature a black hole but the phenomenon itself is impossible to see. So Freas

painted an aesthetic construct of astro-physical equations, a scene only instruments could detect. He visualized the inexpressible and expressed the invisible—beautifully.

Once his mind has become thoroughly saturated with the story both visually and intellectually, Freas is ready to sketch. He works quickly and spontaneously on a small scale using fluid tempera applied with brush, pen, or airbrush. When an interesting pattern starts to emerge, he sets the sketch aside and begins another. After all available flat surfaces in the studio have been covered with drying studies, he goes back to the beginning and develops the set further. He starts transforming the initial abstractions into recognizable forms: a splotch becomes a girl's face; a swirl, a pillar of coral. He never dictates the direction these images take. He tries to keep his mind as free and fluid as his paint, thus letting the picture come forth as it will.

By now, four or five studies show promise and receive further attention. Many potentially lovely paintings have to be discarded at this point because they are not functional as illustrations. Art for art's sake will not suit here. An illustrator must constantly balance the demands of beauty with the practical ones of communication.

Freas combs the manuscript one



more time to confirm that the studies are self-consistent and faithful to the story. Now research is needed to fill in the finer details: how is the tracking mechanism of a radio telescope constructed? What does the inside of a linear accelerator look like? The library of his Virginia Beach home is larger than most small towns' but still inadequate to handle every task. The local librarian's help is supplemented by consultation with experts—he made hundreds of dollars' worth of telephone calls while painting the black hole for "Hero" and quizzed astronomers at the nearest observatory.

Direct contact with the subject itself is also useful. Photographs of Kennedy Space Center are no substitute for the experience of being there. This point is superbly demonstrated by his drawings and Gordon R. Dickson's text for their *Analog* article "A Matter of Perspec-

tive". In order to depict an alien's goat-like eyes for "The Unreachable Stars," Freas observed the square irises of a live nanny goat. A week underwater on the *U.S.N.S. Lapon* yielded information he needed for another assignment. Unfortunately, it turned out to be strictly classified data and the article was never published.

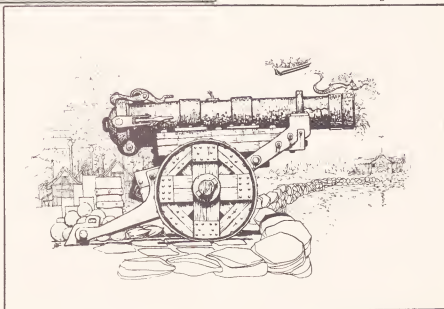
This kind of attention to facts always delighted John Campbell. "No one else ever took quite as much pleasure in knowing that you had spent two hours with a top-flight marine biologist solving the problem of the turbulence-crystallinity ratio in a flash-frozen liquid-atmosphere interface." No matter that the result on the *Star Light* cover is a dark, blurry mass indistinguishable from a beaver dam. However, Campbell was not inevitably pleased with the results of Freas's researches. He scoffed at the wrinkled spacesuits shown on "The Ark of Mars" (1953). Years later, photographs of space-walking astronauts vindicated Freas's judgment but he tactfully refrained from mentioning the issue again.

The artist considers background research one of the advantages of working in the SF field instead of some other. It gives him an excuse to study an immense variety of interesting subjects and acquire a curious range of skills—even though the expertise gained for one assignment rarely survives the beginning of the next.

These last essential details complete the studies' evolution from splashes of color to vivacious 5 x 7-inch paintings. After removing the one he likes least—else it would surely prove the editor's favorite—Freas mats the best three or four survivors and mails them off.

Left: "The Fighting Philosopher." Astounding Science Fiction.

Below: "The Lost Newton." Analog.



ONCE THE editor has returned his selection along with written comments, preparations for the actual cover painting become even more intense. By this time the artist has a sound grasp of the information he needs to present and the technique with which he can present it. For instance, he knows the performance characteristics of space hardware and the methods of indicating distance in the absence of aerial perspective and thus is prepared to paint a convincing-looking space station.

Yet sometimes problems still remain which neither references nor imagination can solve. Terrestrial experience has not equipped our species to envision lighting conditions under multiple suns. But tabletop models can easily remedy this deficiency. Freas contrives alien landscapes using sand, crumpled paper, tinted spotlights, and a cocktail shaker as a spaceship. He has also made models of different kinds of spacecraft: faster-than-light, slower-than-light, impulse powered, patrol boats, etc., and deploys his little fleet as needed.

Impromptu solutions like a fishbowl for a space helmet or a doll wrapped in plastic film for a girl in a transparent spacesuit work in some cases but others require even more ingenuity. Freas once wanted to do a lunar Christmas scene with the moonbase reflected on its spherical surface. The resultant image gave him a useful starting point of his own.

Figurative work requires simple costuming and appropriate models. Freas enlists family (his daughter posed for "A Womanly Talent"; the boy in "The Second Kind of Loneliness" resembles his son), friends, and even total strangers in this enterprise. So indefatigable is he in the pursuit of interesting faces—restaurants are favored hunting grounds—that author Robert Asprin has written a song warning people to stay alert in the artist's presence lest "when you wake up/you're on the front of *Analog*." (This clever fellow himself appears on the cover for "Caravans.") Of course, Freas also impresses himself into service as a model occasionally. He can grimace and wave a blaster convincingly (as for "Your Haploid Heart") but finds comic roles more congenial: the hairless, green voyeur in "Martians, Go Home!" and the battered lion-man in "Pandora's Planet".

The artist is continually adding to his mental file of artifacts as well as faces. Real jewelry becomes alien jewelry. (The designer of the bracelet worn in "Hard to be a God" was so flattered he bought the cover painting and a hundred copies of the book to use in advertising.) Structures at Kennedy Space Center are transferred to other

planets. Alien creatures are designed by analogy to known ones since form can reasonably be expected to follow function elsewhere in the universe. The extraterrestrial in "Sins of the Fathers" has extra fingers but their joints are not unlike our own.

These are only a few of the ways in which Freas obeys his own injunction to observe the known world before attempting to paint an unknown one. He insists that "the more fantastic the effect desired, the more essential it becomes to produce a feeling of conviction in each contributing detail."

At last the artist is ready to distill his accumulated knowledge into image. The chosen study must be enlarged to working size (usually 16 inches by 20 inches). One way of doing this is with an opaque projector focused directly on the illustration board. Freas normally paints with acrylics. He prefers them to oils

because he is allergic to turpentine. He applies paint with brushes, pens, palette knives, sponges, crumpled paper or plastic film, hollow reeds, split sticks, airbrush, or any other tools that come to hand. He uses the airbrush only sparingly (for example, to accent the hearts of stars) despite his skill with this instrument. He does not object to its mechanical nature but to its obviousness. However, he obtains unusually subtle effects by glazing areas with dye suspended in thinned acrylic gel. There is little temptation to over-use this technique—the airbrush is excruciatingly difficult to clean afterwards.

Work begins with thin layers of paint which grow progressively thicker until highlights are applied with a virtually dry brush. The rich coloring of the alien's robe in "Sins of the Fathers" was stroked on with a palette knife on top of brushwork.

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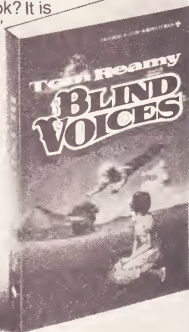
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Freas achieves some especially lovely effects in his backgrounds by swirling, splotching, or crackling the paint, blotting it with tissues or paper towels, or spreading it out in haloes with a drop of detergent. The enclosing maelstrom in the "The Second Kind of Loneliness" and the dappled night sky in "The City Machine" are examples of such controlled randomization. Freas's debt to abstract expressionism has rarely been noticed.

The artist is most often asked about his techniques for rendering surfaces: "How do you make metal look so metallic?" His exasperating answer is: "You look at metal and paint what you see." A shining surface is the same whether on a suit of armor, a coffeepot, or a distinctive Freasian spaceship. The artist's success here rests on his facility with the use of light since textures are duplicated according to the way they absorb, reflect, or scatter light.

He calls light "my most important pigment" and explains, "I use light as a tool rather than as a subject. When I work I am not concerned with how to render a lighting effect. I am concerned with how to use light to express the mood or idea I am after. So much that 'artists' consider subject matter is really—or should be—simply a working tool for the professional picture-maker."

Freas uses these skills to the fullest in "Zenya," a science fictional cousin of Gustav Klimt's "Judith." He expresses the allure of feminine ecstasy in the shimmering language of lighted surfaces. The subtlest touch is the reflection of the rocket glow on the woman's satiny cheek. This links the major and minor motifs of the painting together. Thus the symbol and the archetype share the same order of preternatural reality.

The same virtuosity is superbly exhibited in "The Warriors of Dawn." Color tones unmistakably indicate the time of day. A delectable blue atmosphere holds rugged mountain peaks and orbiting meteors in convincing aerial perspective. A tiny vehicle and its sparkling exhaust trail lend scale to an enormous oval vessel. All the elements mesh smoothly. The image owes something to surrealist Rene Magritte but the luminosity is pure Freas.

The artist takes certain ingenious precautions to protect the art he has so skillfully created. He wants his works to be durable for the sake of collectors and also to satisfy his own standards of good workmanship. Fortunately, acrylics are exceptionally rugged. The paint film can be expected to outlast the illustration board which supports it. But five minutes exposure to the intense lights used in photographing art for reproduction is equivalent to years in sunlight.

Even acrylics can be damaged under these conditions. Freas knows from experience which pigments are most likely to suffer. He reinforces these areas by spraying them with a light-sensitive dye suspended in acrylic. The camera lights destroy the dye instead of the pigment and the picture's color returns to normal. After final coats of polyurethane varnish and photographer's matte finish glaze, the cover painting is ready for delivery.

The cover may or may not be accompanied by interior illustrations. These go through a much shorter evolution, from simple compositional sketches directly to finished drawings which may be executed in pen and ink, tempera, marking pen, or acrylic. The interiors are not necessarily easier to do—they may require extensive background work of their own apart from the research already done for the cover.



Although printed in black and white, they are not always done that way. The acrylics are often painted in monochrome brown to allow a wider range of tonal possibilities. But the advantages of using color can be negated by bad printing. The originals of the fuzzy, murky interiors for "Lifeboat" had been exquisitely rendered in sable brown and deep purple tempera.

Since magazines require so many more interior illustrations than covers, Freas has more opportunities to experiment inside. He can employ a wider range of styles, even within the same story. Each installment of the serialized "Pritcher Mass" is illustrated in a different way. There is also more call for the artist's gifts for humor and abstract design. The confident draftsmanship which characterizes Freas's drawings, whatever their style, was developed by an unwillingness to correct errors. When the artist makes a mistake, he starts over afresh.

Delivering the cover would seem to be too routine to deserve mention. But like every aspect of illustration, it has its own pitfalls. Freas chose the standard dimensions of his cover paintings because this was the largest size that fit into a portfolio he could carry on an airplane as hand luggage. Covers that

must be shipped travel in plywood cases sturdy enough to withstand being run over by a truck—as has happened. When Freas was living in Mexico during the late 1950s, he had to beg passing tourists to carry his paintings across the border. The export restrictions on mailing art were as severe for a magazine cover as for a Mayan fresco.

The editor must approve the finished work before publication. This cannot be taken for granted. Freas's third cover for Campbell was "Immigrant," a surrealistic landscape in which an airbrushed ochre plain receded into an arid, sunbaked infinity. To the artist, it was a technical *tour-de-force*. To the editor, it was illogical. Campbell demanded revision: "Put some grass on that featureless plain." Only after Freas had painted in the turf, blade by individual blade, did he admit this improved the picture. He will alter a cover—under protest—anticipating that he can paint out changes later. But he will never compromise on interiors.

So a few weeks (or sometimes even a few days) after receipt of the manuscript the completed artwork goes to the printer. Covers are photographed with a "one-shot" camera which separates colors into the three primaries plus black. Four-color offset lithography is the standard means of commercial reproduction today but pulp magazines used a crude three-color system which did not register black at all. (Muddy purple made a poor substitute.) Moreover, artists were also instructed to keep contrasting colors isolated in different parts of the picture. This lack of proper shading and the inability to show transitions gave the pulps their distinctive garishness.

Although current printing methods can reproduce any image with total fidelity, the cost of perfection is prohibitive. Freas tries to work within known limitations. He compensates for the 30% of color due to be lost in reproduction and reinforces textural qualities. Some of the vividness and sheen of his originals stem from these fortification measures. All too often, he need not have bothered.

Bad printing is not the only way to spoil visual impact. When designing the official Skylab I mission patch, Freas not only devised a striking emblem, he paid equal attention to practical considerations. His design is photogenic and suited for machine embroidery. But he could not foresee how NASA would display it at Kennedy visitors' center: slanted.

Yet despite every peril, visual excellence manages to prevail. The disciplined imagination of Frank Kelly Freas creates SF illustrations that do delight the eye and stimulate the mind. In our enjoyment is his victory. —G—

The Artist in His Studio

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On The Tenth Of Apollo 11

David Riesman, Fred L. Whipple,
Frank D. Drake, Timothy Ferris,
Robert L. Forward

Part 2

Astronaut James Irwin, lunar module pilot for the Apollo 15 mission, approaches the Lunar Rover. Mount Hadley is in the background.

TIMOTHY FERRIS

MANY OF YOU who read this share, I imagine, a sense of promise with regard to the prospect of the excursion of humans to worlds beyond our native Earth. We may differ with regard to the particulars—some hoping to see manned outposts on other planets within a generation or two, others preferring that a lengthy prologue during which instrumented probes dispatched to the planets precede any human excursions, some arguing for nearby space colonies, a few willing to satisfy themselves with nothing less than galleons built to navigate to the stars. Such a dispersion of opinion has many precedents in the history of exploration. It recalls the European expeditions to the New World whose numbers included scholars and gamblers, scientists and missionaries, those motivated by pure curiosity and those thirsty only for profit. I take it as a sign of the vitality of our impulse toward exploration that it thrives in so many manifestations.

The particulars aside, I think many of us share a sense that we may live on the threshold of an age of migration into space. We have learned how to begin the exploration of space, and almost simultaneously we have discovered that the universe is so rich and varied that it promises to absorb any conceivable scope of adventure. We would like to

impart to others the excitement this state of affairs creates in us, to help them see that this world is only one world, to suggest to them that if we humans care to make it so, our age can become the dawn of the human story, not its twilight.

How can we do this? Among the many arguments offered in support of space exploration, how can we most readily distinguish between the spurious ones and those that will stand up in the light of history? How can we determine the real, as opposed to the merely sophistical, reasons that justify our impulse toward adventure and permit us to propose that our societies commit time and money to hurl people off the earth?

The question is practical as well as philosophical, for we have no assurance that space exploration will go forward forever of its own accord. The impetus to exploration that revealed itself in Columbus and Prince Henry the Navigator continues in our own time and is strong, but it is not necessarily inexhaustible. Many people today feel that even the modest efforts of the contemporary American space program are too much, and their arguments are not to be sneered at, nor are they destined to fail. History is filled with stories of truncated adventure. While Prince Henry's little ships were survey-



Photo Credit: Armen Kachaturian

ing the west coast of Africa, the east coast of Africa was being visited by expeditions numbering tens of thousands of men, dispatched by China—a society more sophisticated and imposing than that of Portugal. Yet the age of Chinese blue-water seafaring, which may have sent ships to lands distant as South America, ended abruptly with the recall and denunciation of the explorers and the burning of their logbooks. Those of us who argue for space exploration need to seek true arguments not only because the truth alone is worthy of our expensive goals, but because truth is the best proof against failure.

I do not propose to list those arguments for space exploration that are most nearly true. But I would like to offer a few guidelines.

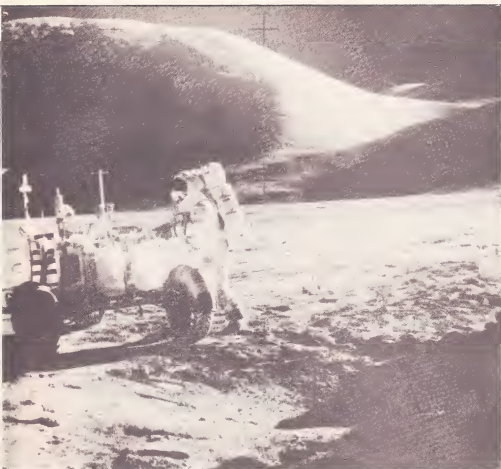


Photo Credit: NASA

future, let us remind ourselves that the cosmos we seek to explore is nothing other than our surroundings, our environment writ large. We have always lived in the cosmos; the only thing new is our discovery of it. We are made of the stuff of stars, have lived out our lives amid the stars, and our charter to explore the stars is none other than the mysterious toilings of the systems of stars that have lent us life. The starships we hope to bequeath to our great-grandchildren are not solely vehicles for leaving home; they are for going home.

FRANK D. DRAKE

THE CRYSTAL BALLS of years gone by, so perfect at the time, have turned out to be made of the poorest of glass. The future gleaming through them was, alas, distorted. And, worst of all, they turned out to be opaque when it came to seeing some of the most important future advances. The bomb, the jet plane, the pill, even the automobile lay hidden in the mists of every crystal ball in which they might have appeared. Then beware of crystal balls, and thus all that is offered here. Some of what I say will happen, even to a greater degree than I foresee; some, so seemingly obvious, will not; and some of the most important things will come upon us without prophecy or warning.

I see a future guided by two key principles. First, we have entered an era, a seeming one-way street in which large pioneering projects are undertaken only by governments—governments which, happily, are becoming more democratic. But governments do not have the freedom of action of individuals. As a result, the prime governmental principle will play an increasing role in what is done: we shall do only those projects with an acceptable benefit-to-cost ratio. And the benefits must accrue to the many, not just the few. The other principle: we will explore—and, where beneficial, exploit—any enterprise which is permitted by the laws of physics and the arrangement of the universe. Only now has the march of science and technology enabled such grand possibilities. If we accept these principles as the basic recipe for our future, what does lie before us?

I see the space around our earth becoming a much-used workshop of our civilization. Communication satellites will dot the celestial equator like sparrows on a telephone wire. Amongst them will be a different breed, the large satellites which will transmit television programs directly into our homes, educational programs to be used regularly in schools and homes, and information on markets, weather, and

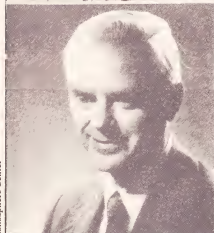
First, let us shun hyperbole. It is tempting, especially when buoyed by the applause of sympathetic audiences, to proclaim that life in space colonies or on other planets will be somehow more uplifting than it is here; or that its products will pay back its costs; or that its technological spinoffs will seed a material paradise; or that space offers a solution to overpopulation or to the ecological crisis. When the applause has died down, we have to admit that even the most plausible of these grand claims amount to little more than guesses or assertions of faith. They resemble the argument offered by some of the more credulous advocates of the search for extraterrestrial intelligence, or SETI, that alien beings might be expected to advise us on how to avoid nuclear war—they do their cause more harm than good.

My second suggestion, related to the first, is that we refuse to champion space as a hedge against apocalypse. It may be true that our species stands imperiled by its own behavior—certainly western civilization so imperils itself—and that so long as Earth remains the sole abode of human life we shall have all our eggs in one basket. And space exploration does offer an intelligent response to that predicament. But it is only one in a spectrum of responses, and it alone will not save us. If humans

are to continue to prosper, their wisdom must outrun their folly—on Earth as well as in the heavens. We cannot expect to escape our woes by stampeding toward an exit sign whose arrow happens to point straight up. If we pretend that we can—if we try to *sell* space as an escape hatch—we shall deserve the contempt of those whose view of their fellow humans is less cynical and more loyal.

Third, I think we ought to acknowledge that inasmuch as space exploration is exploration, we do not know where it will lead us, or what we shall find. The stars may harbor shores as sweet as those upon which the Samoans proffered breadfruit to Captain Cook, or caves that reek of the breath of Cyclops. Our fortunes among the stars may prove to be full of revelation or terror, transfiguration or doom. People who are terrified of what we might find in the starry jungles may be justified in their fears; so may be others who are jovial and optimistic. We simply do not know. The alternatives of cosmic loneliness and cosmic company... are they not enough to box the compass of many a heart? We shall be changed when we leave our world, as our ancestors were changed when they left their forest Eden, and there is little point in pretending we know what we will be changed into.

Let this seem too chilly a view of our



travel—which planes are late, and which on time.

The near-earth space will be, far more than today, the homes of our celestial eyes and ears. Only a few decades hence, there should be optical and radio telescopes in the sky which would bring tears to the eyes of today's astronomers. Optical telescopes built in the style of the new multi-mirror telescope on Mt. Hopkins in Arizona will be in space with apertures of perhaps fifty meters. Beside them will be giant radio telescopes, modelled after the existing Arecibo reflector, perhaps three miles in diameter. The use of a spherical reflector, as at Arecibo, with free-flying spacecraft to collect signals at the focal point, will allow the telescope to look at different parts of the sky without requiring motion of the large reflector itself, thus greatly reducing energy demands. With both optical and radio telescopes there will be subsidiary telescopes, each larger than any we

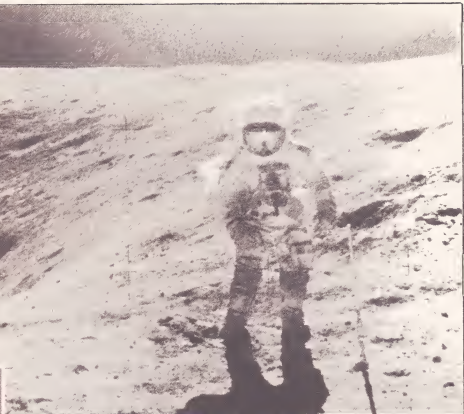


Photo Credit: NASA

have today, which will work with the main telescopes as optical or radio interferometers. With these systems we will see the universe with a clarity which will make our present telescopes appear as trivial as the first telescope of Galileo seems to us. We will see the planets of other stars, and even know the nature of some of these planets; we will see all in our universe in incredible detail. The radio telescope will, very likely, detect the radio murmurings of not one, but many extraterrestrial civilizations. The earth will have become a citizen in a far-flung community of civilizations in our galaxy. Life on earth will become incredibly richer through this conduit of knowledge.

These telescopes in near-earth space will be where humans are found. To construct, to maintain, to operate these huge systems—this is where it will be cost-effective to use human beings.

We will be sending ever more sophisticated spacecraft to explore the planets of the solar system. All highly automated, with sophisticated systems of artificial intelligence in command: rovers on Mars, "aircraft" perpetually floating through the atmosphere of Jupiter, and even flying through the valleys of Titan.

Humans will be in space, but primarily to operate the awesome instruments of astronomy and space physics. Of humans in space colonies and manufacturing planets, I have my doubts. The first principle rears its head here. We don't build buildings a mile

high, even though we could. So we will not build colonies or factories in space until the benefits are greater than the benefits to accrue from spending the same resources on earth. It seems to be that there is a long way to go before what can be done on earth is more costly than achieving the same result in space. We can cover the oceans with vast floating cities, transform the deserts of the world into verdant Edens, even build vast comfortable habitats in the arctic for less cost per person than the cost of providing human accommodations in space.

The same applies to space power systems, capturing solar energy and transmitting it to the earth in the form of microwaves. We can build a phalanx of nuclear power plants in some remote place, perhaps the arctic, and ship their power south at less cost than building power stations in space. I think all of these steps will take place on earth before humans, only in the very distant future, inhabit space in any sizeable numbers.

My crystal ball sees a certain development which will have the most profound effect of all on our way of life. Not a development in space, but one growing out of space technology, and one deriving from the second principle, that we will exploit anything permitted by the laws of physics and the arrangement of the universe. That development: the elimination of aging, the achievement of nothing less than effective immortality for human beings.

There is nothing in nature which requires us to grow old, to deteriorate. That we do is an artifact of evolution, in fact a necessity in evolution if there is to be room and food on earth for new creatures to have a chance to demonstrate their superiority over the old. Without death, there could have been no evolution. But, we are content with our evolutionary state; life no longer needs death. Just as we can remove a defective kidney or correct a diseased artery, on a much more sophisticated scale it should be possible to eliminate the sources of aging. Already we are making giant strides in this matter, and as we turn our space age instruments and computers to the problem, one can feel that we will have solved this problem within, say the next hundred years, which is but an instant in the cosmic time scale.

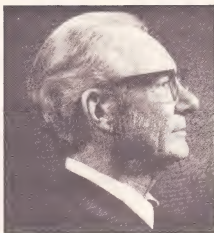
What will our earth become then? It is almost impossible to imagine. The value of a human life, with its wealth of wisdom and potential for eons of activity, will increase dramatically. We will remove to an enormous degree all sources of hazard to us. Our cars will be far safer than now, crawling at a snail's pace—after all, who is in a hurry? Perhaps even airplanes, because of their slight hazard, will disappear from the terrestrial scene. Human reproduction will be extremely rare. New ethical and political questions will arise: who will be permitted to reproduce, and who will make such decisions? The potential for both abuse and progress will be great. We will have enormous life spans within which to build a terrestrial paradise. Concern for the rights of others will be very great, indeed. Almost surely there will be major changes in our way of life which we cannot now predict.

In the end, we will transform all the earth into a paradise in which all can have the specific way of life, the pleasures, even the climate, which suits each individual.

FRED L. WHIPPLE

THE SPACE AGE began for me personally in the late winter of 1943-44. After nearly three decades of reading, talking and dreaming science fiction, I was still uncertain as to when we would break the gravity barrier. That winter, I was in the UK as Chief of Chaff (unofficial title) for the U.S. Army Air Force. My war job involved the development, production and tactical use of aluminum foil strips (code word Chaff) to be dropped out of aircraft, confusing enemy radars. The top-secret information of the liquid rocket firings from Peenemuende did not impress me as a serious immediate war threat. But it

Frank D. Drake/Fred L. Whipple



overwhelmed me when I viewed it as the morning twilight of the Space Age. In my lifetime I could expect actually to see artificial satellites and, hopefully, manned space travel.

In 1946 I joined the Rocket Research Panel to help guide the scientific effort utilizing the "liberated" V-2 rockets. That summer I made my first direct contribution to space travel: the invention of the "meteor bumper," now called the meteoroid deflection screen. Tiny rocks in space become meteors when they strike the atmosphere at speeds above 6 miles per second; they can puncture the skin of spacecraft. They will explode, however, at a thin second outer skin on the ship to reduce the penetration hazard by about a factor of ten. When the meteoroid screen caused so much trouble on Sky Lab, I was rather pleased that it was no longer called the Whipple Meteor Bumper.

In the intervening years to 1955, with its International Geophysical Year rocket and satellite program, I spent much time and effort along with many others, selling the idea of a space program to

Michael Moorcock's Epic Hero—ELRIC by MICHAEL WHELAN



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the public, to the military, to Congress and to my scientific peers. I remember vividly the first serious scientific symposium on space exploration, held in November, 1951 at San Antonio, Texas. Special memories surround cocktails, dinner and a long-into-the-night bull session with Wehrner von Braun, Joseph Kaplan, the upper-atmosphere physicist, and a highly skeptical Cornelius Ryan, then a writer for *Collier's Magazine*, now famous for his *The Longest Day*. Ryan came to the symposium thinking that artificial satellites and space travel were pure fantasy. He didn't have a chance. Von Braun was not only a prophetic engineer and a fine administrator; he was perhaps the top salesman of the 20th century. Furthermore, Kaplan carried the aura of wisdom associated with the prototype learned scientist. By midnight Ryan was sold on the space program and soon convinced *Collier's* to produce the series of superbly illustrated articles that led to the books *Across the Space Frontier* and *Conquest of the Moon*. I firmly believe that the symposium and the *Collier's* articles were important keys, without which the door to space might not have been opened for decades. In retrospect I am a bit amazed that the efforts of even so many of us actually succeeded. I think it proves that the old tradition of conquering the wilderness still lives (or lived) in American blood. The Apollo program was certainly the crowning achievement of this frontier tradition.

The Apollo program, however, created a dilemma for serious scientists. As such, we were expected to back the program for its scientific value. But every scientist knew that we could obtain the equivalent scientific return at a fraction of the cost by means of unmanned space probes. The real reason for sending men into space and to the Moon was and still remains: to master space and then to colonize space. I make no comment about possible military goals.

In any case, the most thrilling moment of my life happened in the Manned Space Flight Center at Houston as I watched the landing of Apollo 11. The mounting tensions, the frustrations, the worries and the self-doubts were all swept away at the instant the Eagle landed safely. Since that instant mankind is no more confined to this tiny planet! The human race has come of age!

Fortunately, because I am an astronomer, the Space Program has brought me a continuous succession of scientific thrills, one or two surprises and many new questions. The heat, pressure, and dryness of Venus' surface still fill me with awe as do the colossal extinct volcanoes and rift valley of Mars. How was the Moon formed to rid it of its

volatiles? And why did Mars have to be so lifeless? Does any hope remain for finding even the most primitive life forms there? At least ice is present, a boon for colonists, which seems not to be true for the Moon. Or is there permafrost at the lunar poles?

We now know more about the interiors of the Moon, Mars, and even Venus than we knew about the interior of the Earth when I was born.

The great satellites of the solar system are now unique bodies, not just points of light. One, at least Io of Jupiter—is active volcanically. The details of solar system evolution are being spelled letter by letter with the aid of the Space Program. But a major need remains: a rendezvous with a comet. These dirty ice balls are the most primitive bodies of the Solar System, the building blocks of the great outer planets Uranus and Neptune. From them we can expect revealing evidence about the early times when a great interstellar cloud of gas and dust collapsed to form the Sun and planets. The opportunity still remains for us to send a probe through the great Halley comet in 1985 and then rendezvous for a year with Comet Tempel 2, circa 1988. But we must act now, in 1979, or we will have to wait 76 years for Halley to return, or settle for later studies on lesser comets.



DAVID RIESMAN

YOUR READERS and you regard the moon landing as a large leap for mankind, or indeed a giant leap. This was the reaction of people all over the world—with the exception of students in the humanities and social sciences at the selective liberal arts colleges, who expressed either boredom or antagonism to the moon landing, found no excitement in it, and aggressively refused to watch events on television. For these individuals, the whole NASA enterprise, if not complicitous as quasi-



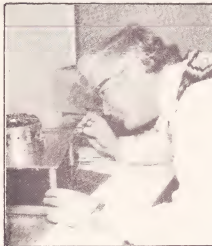
Photo Credit: NASA

military, was seen as a diversion of resources from "real" problems of poverty or hunger on the surface of the Earth. They found no adventure in it, only waste. It was not an attitude I myself found appealing; I prefer the adventure of NASA to the nuclear arms race—it is perhaps not the most "moral equivalent for war" one could find, but given the combination of American enterprise and American defensiveness, it has ancillary virtues in the demonstrations of competence and courage. But the attitude among many young Americans toward technology in general, even when it does not appear to them as some kind of stunt, remains strong; how these young people, themselves mostly from affluent backgrounds, expect the world to be fed, housed, and clothed without advances in technology is hard for me to understand, although I would share the outlook that one has to evaluate such advances and that not all of them are benign.

ROBERT L. FORWARD

IT WAS great to be an American ten years ago. We had put a man on the Moon! Yet on that day—for the first time in my life—I felt that I was "more" than an American. I was part of the whole human race.

For someone who "never watched" television, the Apollo 11 landing on 20 July, 1969, became a 24-hour total experience in viewing. Sitting down with a pillow and plenty of provisions in front of my newly purchased television, I watched everything; every "simulated picture" animation and all the preambles, from the minute the networks came on the air to the closing commentaries of the pundits as the



astronauts settled in for a night's rest.

The first excitement in the mission was the terrifying tension as the voices came crackling in from the rapidly dropping lander—the obvious fakeness

of the network animations only heightening the apprehension.

"Two hundred feet, four-and-a-half down...kicking up some dust...four forward...drifting to the right a little...contact light...engine stop..." There was a long pause, then, "Houston, Tranquility Base here. The Eagle has landed!"

Finally came the time when the outer hatch door was dropped. The television camera attached to the door looked out on a smoothly roly black and grey lunar horizon with the angular silhouette of the lander slashing its harsh black and white mechanical presence across one side of the screen.

In all the movies; in all the science fiction stories; in all the imaginings of what the first landing would be like; no one had ever imagined that it would be possible for the whole world to stand outside the newly arrived spaceship as

the first man on the Moon laboriously worked his way out the hatch and down the ladder, and actually witness him taking the first step on the Moon!

What really impressed me as I waited for the astronauts to emerge, were the live scenes bounced by communication satellites from countries in Europe and Asia, showing strange foreign faces as enraptured as I was by the miracle occurring on the television screens in front of us. I looked at those faces, and finally it struck me. These weren't strange beings. They were humans—just like me. Each one of us, in order to be a participant in the wondrous event, had to drop our nationality, forget the color of our bodies, submerge our individualistic egocentric personalities, and become one with the lone human crawling backwards on hands and knees out of a too-narrow hatch—into the blazing vacuum of sunlit space.

ISAAC ASIMOV

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CROWN



Then came their adventure out on the airless surface. Both men began bounding over the Moon's surface, busily setting up experiments. They didn't forget us, though. A ghostly apparition bounced toward the camera like a broken field runner, kicking up spurts of dust as he came. There was a moment of vertigo as the camera was taken from its fixture, then we, too, bounced across the surface until we were set up on our tripod so we could watch everything that went on.

It was a great time to be a human being. Nothing could stop us, nothing! More flights followed, each one more ambitious than before. But then something happened. The thrill that made it all worthwhile faded away and the miserly, pinched, cautious, scared little being that lurks within us all came to the fore.

Like a little child playing out in the fields as night approaches, Apollo was called home. The journeys out into deep space were put on hold.

As the years have passed, my greatest discovery has been that the emotional involvement that I experienced in front of my television set was not mine alone. The same feeling came to everyone—the guard at the plant gate, my wife, the butcher, my 75-year-old mother—all get that same glowing gleam in their eyes whenever they relate their personal recollections of that event. Even today, you can see the same thrill of wonder in the eyes of young and old alike as the engage in the near-miraculous act of touching the Moon rock at the Air and Space Museum.

That moment—that rock—that Moon—belongs to all of us, and the lives of everyone on earth were touched and moved by those momentous years. John Kennedy knew how to reach that greatness that lies in every person, old or young, male or female, rich or poor. He reached past the squalor and greed, the natural cautiousness and fears, and drew that greatness out from the breast of this nation and used it to send us to the stars. We are all on this earth for only a short time. We all have to die sooner or later, why not do something interesting while we are here?

We have retreated back to Earth. The Space Shuttle is merely the first check item in the long countdown that will be needed to take us back out again, for the Shuttle will serve only to put us into a holding pattern in near-earth orbit. It is a long way back to the Moon, and an even longer distance to Mars. It will take many steps and much time before we again blast off into deep space. We need to get moving! But we wait—marking time.

T plus ten years...and still holding... —G—



Photo Credit: Charles C. Parks

SF Answer Man

Have a question for the SF Answer Man? Address it to SF Answer Man, *Galileo* Magazine, 339 Newbury Street, Boston, MA 02115. The Answer Man says he will make a sincere effort to deal with all serious inquiries. Questions must be typed, in English, on paper. The Answer Man reserves the right to edit them and regards submission as consent to publication. He doesn't pay a dime for the letters he uses, either.

DEAR SF ANSWERMAN: Can you settle a bet? My friend thinks that Kelly Freas draws his characters from imagination. I think he uses real models from southern California. Who is right? S.C. Hughes
Hawthorn, California

Dear S.C.,
I am afraid you lose. Kelly Freas lives in Virginia and he keeps such a busy

schedule that he rarely gets to southern California. But if you've ever been to Virginia, then you can understand that you're on the right track. I hope you didn't lose too much money on this.

Dear SF Answerman:

If you have seen the movie *The China Syndrome*, then you know it raises some disturbing questions. I am putting one of them to you: What do the Chinese call a nuclear meltdown?

Kyle Moore
Oil City, Pennsylvania

Dear Kyle,

I checked with the Chinese Embassy on this one and they said they didn't think they would have any meltdowns in the near future and they haven't yet decided on a name. They are, however, thinking about calling it 'The Pennsylvania Peril.'

Dear SF Answerman:

In the past few microns since the cancellation of our beloved television show, the Battlestar has continually been attacked by Cylon raiders. How can we make them understand that the show is over? They always were pretty dumb, but this is ridiculous.

Adama, Commander
Battlestar *Galactica*

Dear Adama:

Why don't you make a movie and show it in theaters all over the country? This will give you the chance to let the Cylons down easy and make a few cents on the same time.

Dear SF Answerman:

I recently acquired *Mirkheim*, by Poul Anderson, unbeknownst that it was in a series of stories about David Falkayn. Since I found this out I have repeatedly tried to find the titles of the other books in the series. My various attempts have been unsuccessful, and now I turn to you for the information I require. With a desperate plea to your unsurpassed skills, I ask for help.

William Levitch
Knoxville, Tennessee

Dear Mr. Levitch:

Anything about this dude which you cannot find in The People of the Wind, Trader to the Stars, The Trouble Twisters, or Satan's World, will probably be in The Earthbook of Stormgate. Is that enough to keep you busy for a while?

Dear SF Answerman,

Nobody really thought it would be possible to stow away on *Voyager 1*, but here I am. It's kind of cramped, but otherwise it's been O.K. I was able to lay in a supply of pizza when we flew past Jupiter and whenever I get bored, I

[continued on page 23]

On the Tenth of Apollo 11/SF Answer Man

Robot

Alex Stevens

Robot

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GALILEO 21

Robot

Alex Stevens

SPECIMEN 0147K1

GALILEO 21

Robot

Alex Stevens

SPECIMEN 0147K1

GALILEO 21

NASA Notes

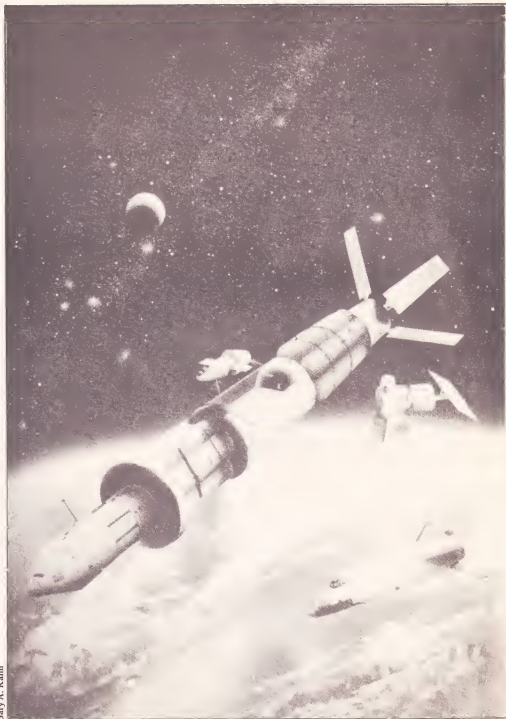
Thomas L. Owen

IN OUR LAST installment we reported developments in x-ray astronomy. Now things are happening on two other wavelengths. An infrared telescope on the slopes of Mauna Kea, Hawaii's highest mountain, is being used to plot hot spots on Jupiter. This data was used to program observation by Voyager 2 on its Jupiter flyby in July, and it's hoped there will be further use for the telescope in directing the Saturn flybys of Voyager 1 and 2 in 1980 and '81 respectively. And on a different wavelength, an orbiting ultraviolet astronomy satellite has discovered a corona of hot gas (180,000°F) surrounding the Milky Way galaxy (Shades of Star Trek's galactic boundary!). The gas has a density which is a million times less than the best vacuum ever recorded on Earth, but it does excite astronomers who speculate a "galactic wind" and other possibilities.

•But it's hotter than that closer to home. Analysis of results from the Voyager 1 probe which passed near Jupiter in March reveals that existence of a plasma (ionized gas) layer between Mars and Jupiter. The layer has a temperature between 300 and 400 million degrees Centigrade, a hundred times hotter than the surface of the sun. Fortunately the density of this phenomenon is, like the galactic one, extremely low, or else Voyager would now be so much vapor in space.

•Galileo believes the most important work that NASA can do is to engage in and promote the exploration of outer space. It is the frequent response that agency funds have been cut back so severely as to make this more and more difficult. However, in compiling this report we find numerous examples of the agency expending its resources on projects which seem extraneous. In

22 GALILEO



Gary A. Kalin

weather research, for example, it seems that if we never get to the moon again, NASA will at least be able to tell us on what nights Luna can be seen clearly. We do not find fault with the projects themselves, but rather with NASA's engagement in them when that agency should be concerned with matters of greater bearing on its primary aim.

•For example. The next time you take a trip on a commercial airline, one from America or, say, Britain or Holland, you may be sending information about the weather around the world. As part of an international project involving NASA and the UN, a number of commercial

aircraft have had weather monitors installed which broadcast location, windspeed, and other factors eight times an hour. Via satellite and other means, the data is reported around the world and used by aircraft in plotting courses that take the best advantage of weather conditions.

•There's a certain logic to the idea. That is, the NASA Alabama Center has been managing a Department of Energy project to develop a solar powered air conditioner. A successful test was conducted in March of a unit capable of cooling the average US home. There's more. This unit at certain times can

Nasa Notes

produce more power than it needs. The excess can be used in the home or fed back to the power company. Think of the great white way lit up by the air conditioners of Los Angeles.

•Then in another energy project, NASA, with the Bureau of Reclamation, is going to erect a windturbine generator in Medicine Bow, Wyoming. This is not your typical backyard windmill, but one capable of generating one to five megawatts and meant to be operated in tandem with hydroelectric systems. Those would cover on the days when the wind dies. Such large scale development may neatly sidestep the energy companies' dislike of private individual producers who have the gall to make their own power and ever try to sell the excess back to the companies. Bring on the energy prohibition and stamp out moonshine power!

•*Galileo flies!* Galileo II, that is. It's a NASA research jet operating in Saudi Arabia and south-west Asia this summer in a study of monsoons. These torrential downpours are essential for crop growing in that part of the world, but flooding from them left three million homeless last year. The plane will carry a load of instruments that will measure everything from air density to the formation of clouds...With all the agencies NASA cooperates with, one hopes they're not doing too much for the CIA.

•On the other hand one wonders if maybe NASA is making money. They've built satellite receiving stations in Canada, Brazil, etc., launched satellites for over seventeen foreign countries, and engaged in numerous projects with various government agencies. Many of these things were supposedly paid for on at least a cost basis by the various agencies, countries, etc., and if those customers, as it were, are getting the benefits of American government contract accounting (i.e., cost overruns, inflation factors, and all the wonderful things that contractors often do to the government), and if NASA is passing that on to its customers, then it may be the most profitable agency in the United States government.

•In its never ending quest to make the universe safe for petty government rivalries and bureaucratic excess the United Nations Committee on the Peaceful Uses of Outer Space is considering a proposal that could outlaw private enterprise use of the Moon and asteroids. We're sure this will do wonders for peace in space, stop all those overaggressive corporations and entrepreneurs from their warmongering activities. Everyone knows wars are started by private enterprise, right? In previous years the United States has opposed this proposal and we hope it will continue in its opposition. —G—

Nasa Notes

SF Answerman **[continued from page 20]**

can play records. I want to come home now. Can you contact the *Salvage-1* team for me?

J. Crater
Voyager I

Dear J. Crater:

Is this a put-on or what? I checked with the Salvage-1 people and they can't handle a job like that. They say the best they can do is launch a few pounds of pepperoni after you.

Dear SF Answerman,

Has the Skylab come down yet? Some of us are getting kind of tired of all this meditation.

Institute of Psycho-Kinesthesia
Brookline, Massachusetts

Dear Institute,

Everybody is very happy with the job you did on Skylab. Only please, don't try to do anything about inflation, the ozone layer, or the petroleum shortage.

Dear SF Answerman:

I think you should stop making fun of *Battlestar Galactica*. After all, it's only a television show. If you want depth of characterization, scientific authenticity, relevance of theme, consistency of plot, and such things, why don't you come to the movies once in a while?

Buck Rogers
The Twenty-fifth Century

Dear Buck...

—G—

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Doomsayer

Murphy

The Great Animation Theft

EVERY WHICH way, you lose...

Despite increasing pressure from the powers-that-be, the proliferation of the video tape in the 1970s and the video disc in the 1980s resulted in a communications revolution which almost got out of the government's hands... Almost.

Laser technology and computers were combined with the disc systems allowing the home user not only to record, but program. It is at this time that animation came back in popularity, with the video unit programmed to allow the user to conduct the actions of selected forms at the same time. Animators sold copyrighted characters drawn from 360 angles and reduced to 129,600 combined image information units on a single computer chip. The user could then purchase his favorite characters at his local videoshop, take them home, and play with them in infinite permutation. The same was possible for photographed images making use of live models and a fantastic variety of backgrounds (this was a delightful boon to the pornographic business), but the popular taste ran to the incredible assortment of animated characters.

The impact on the art world brought on a whole new movement, the Disneyists, employing new skills and limitless imagination. The "Modern Art" movement which had dominated the twentieth century with its anti-intellectualism was finally dismissed by a public which

revelled in an orgy of creativity (Picassos for sale at 1920 prices). Individual video artists, writers, painters, and sculptors became superstars rivaled only by the top athletes in the sports world. The Big Three networks, after fighting the technology that made the revolution possible (copyright infringements, etc.) finally gave up in 1993 and publicly admitted ownership control of three of the largest animation studios—having covered their bets.

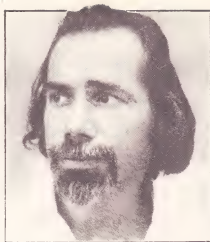
But that was what you gained. Ha!

You must remember, I was an art-form once myself; my flesh and bones like clay in the hands of the *comprachicos*! I know what pleasure you take in your petty games. I know that the rot from within will finally kill the tree.

In the late 1990s, with major religious movements combining their power with that of fearful bureaucrats desperately clutching at the last vestiges of FCC control, the government passed and began to enforce a series of laws restricting video, having finally established through the Supreme Court that the first amendment covered only the print media. For the public good, producers of video were licensed. Closed shop union laws were used to eliminate the "free lance" artist. Copyright laws were upheld to prohibit the sale of individually programmable video units. Pornography statutes dictated by local communities were activated to prohibit the sale of material deemed unfit.

It never takes you folks long to turn good to ashes...

By the turn of the millennium, the boom was over. Short hair was back again, and there was concern over the Micronesian war in the Pacific. But then, what does that have to do with Bugs Bunny, heh Doc? —G—

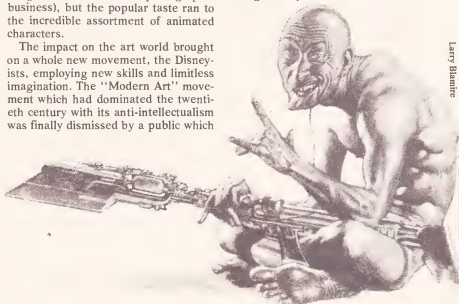


Opinion

Robert Silverberg

I SPOKE last time of the retreat from the New Wave, of the return of science fiction to more conventional modes of narrative, of the renewed respectability of such things as plot and character and incident. Such things never really went out of circulation—after all, Clifford Simak and Poul Anderson and Harry Harrison went on writing all through the 1960s; Ursula Le Guin and Larry Niven and Keith Laumer appeared and won wide followings; it wasn't all Ballard and Moorcock and Lafferty and Delany—but there was certainly a period when straightforward narrative was unfashionable, vaguely embarrassing. That has ended.

A lot of the freakiness of the 1960s has ended, after all. It was a necessary period of social upheaval, but like most such (cf. 1789, 1917, 1848, etc.) it broke a few omelets while the new eggs were being hatched. But we have outlasted the period of extreme racial polarization (when was the last time you heard anyone called a honkie?), of naive condemnation of capitalism (the Maoists of 1968 are the bank clerks of 1978), of institutionalized paranoia (we tend once again to assume that our leaders are inept rather than monstrous). Excepting the women's movement—which needs to win a couple more big battles before it can begin making its own rhetorical readjustments—the 1970s are a quieter



Larry Blumstein

place than the 1960s. It is a decade of consolidation rather than revolution, a time of stock-taking and mature examination of the vast new problems faced by post-imperial America. Confrontation is giving way to contemplation and calculation.

In science fiction, as everywhere else, the trend is back to basics, but the style and volcanic energy of the 1960s remain as underpinnings for this more conservative era as we grope toward the new Ground Zero. A lot of junk is being published, but that's neither surprising nor objectionable; and what is going on in the upper levels of literary achievement in our field is heartening.

Basics. Ground Zero. What commodity is it that writers of fiction try to deliver, anyway?

Several, of course. Novels approach us on all sorts of levels. The primary one, I think, is narrative: *what happened*. They offer us chunks of vicarious experience. This is as true of *Ulysses*, sending us through that spring day in Dublin of 1904, as it is of *Conan the Conqueror*. It is as true of *Remembrance of Things Past*, recreating a vanished Paris, as it is of *Dune*, inventing worlds yet to come. We enter into the world of a novel and are lost in it, and live in it in a state of heightened reality, and it is that simple, almost primitive, eclipse of one reality by another imagined one that is the essence of fiction.

Of course, novels deliver other commodities, too. One is information: chunks of predigested data, valuable to the questing reader, on the workings of the stock market or the nature of the orgasm or the inside maneuvers of the Continental Congress. Science fiction is pretty well useless for this sort of thing, except for the books that provide sound and trustworthy groundings in celestial mechanics or the theory of rocketry and the like; outside our field, though, much of the appeal of fiction these days lies in the quantity of pure journalism it can deliver.

There is insight into character. We can learn about other people, and even ourselves, by observing the interactions of fictional characters. Here, too, science fiction has little to offer, when we contrast it to the work of Cheever or Mailer or Malamud or Tolstoy or Balzac or Proust. But lately some of us have been trying, at any rate.

There is intellectual stimulation: the novel as game. Detective fiction is probably the purest example of this, but much SF partakes of detective fiction's structural qualities (in Asimov most explicitly, but in a lot of others in a metaphorical sense, their mysteries being cosmic rather than criminal).

There is social criticism. Here, too, science fiction excels.

There is appreciation of form—a sophisticated pursuit, in which the manner of telling becomes as important as the content, or even more so. The way Joyce tells *Ulysses* is as significant as its matter: not merely the architecture of the book, but the shifts in tone from section to section.

But here, I think, is where SF's revolution of the 1960s went on the rocks. In searching for new ways of telling stories, in emphasizing style and structure over content, we departed from that primary goal of fiction, validated by consumers of the product since the day of Homer. We ceased to deliver the commodity that makes people turn pages. We played with our readers' heads on all sorts of levels, but turned away from that substructure of incident and event and character and conflict that in calmer times we accept as indispensable. Those of us who read

Homer in translation know nothing of his style, but we remember always what Hector and Achilles were like, or how Odysseus fooled the Cyclops. The jazzy, fragmented, hip, relevant science fiction of the late 1960s fulfilled needs—mainly the needs of its writers, and of those readers who intended to become writers. We are back now to *who, what, where, when, and why* as building-blocks. I am not at all sorry to see Jerry Cornelius disappear, though I would be saddened to see him replaced by Kimball Kinnison. We stand at the threshold of the 1980s; we have survived a time of revolution; we have, I hope, integrated our divergent excesses into something more harmonious; now let us produce a science fiction that avoids both elitism and subliteracy, fiction that holds readers so that they stand spellbound as we tell our tales, and cannot choose but hear. —G—

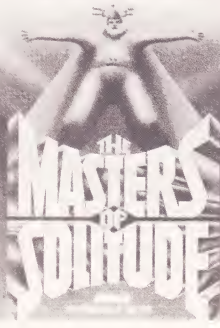
IN THE FAR AWAY FUTURE, WAR IS THE ONLY HOPE AND SOLITUDE IS THE ONLY WEAPON

The Plague is once again upon the people of the forest. A pagan world of sensuous joys governed by covens, tribes of hunters and magicians.

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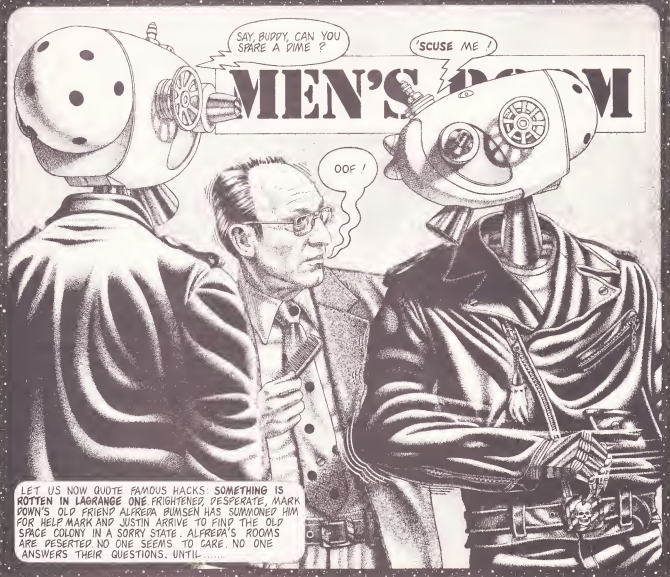
"Brilliant...every page of it holds the reader enthralled. Kaye and Godwin have created a living world!"—*San Diego Union*

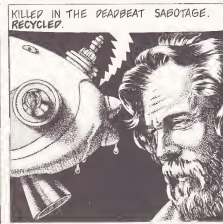
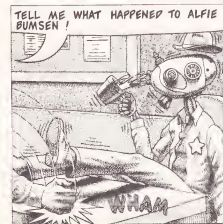
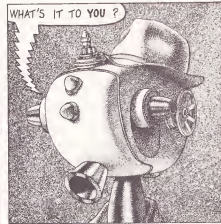
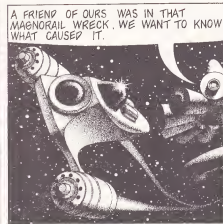
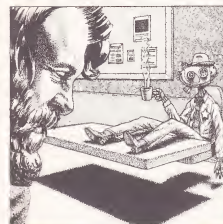
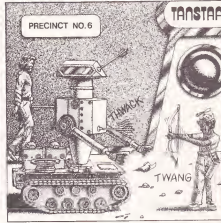
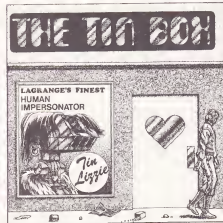
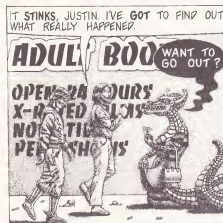
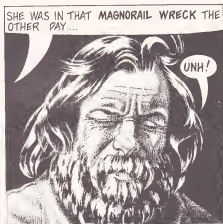


WHO CAN TELL US WITH ANY DEGREE OF CERTAINTY WHETHER THE DRAMA WE ENACT IS COMEDY OR TRAGEDY? DOES AN UNSEEN DIRECTOR STAND BEHIND THE SCENES—OR HAS HE LEFT THE THEATER? IS JUSTIN CASE, 23, MALADJUSTED ASSOCIATE CITIZEN OF AN OVERCROWDED EARTH, THE HERO OF HIS PERSONAL PLAY—OR THE FOOL? WE KNOW THAT LIFE AS AN INDENTURED ASTEROID MINER OFFERED A GLIMMER OF A HAPPY OUTCOME TO JUSTIN—UNTIL THE DAY HIS GOPHER CRASHED ON AN AIRLESS PLANETOID, UNTIL HE DISCOVERED AND IN DESPERATION ACTIVATED THE ALIEN DEVICES THAT HAVE TAKEN HIM.....

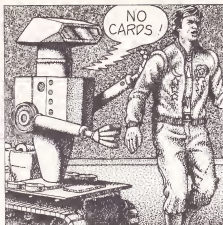
CROSSWHEN

by John Kessel and Terry Lee

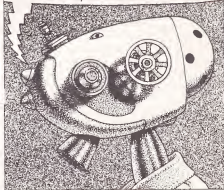




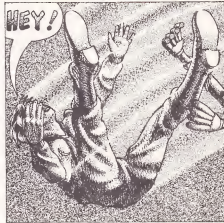
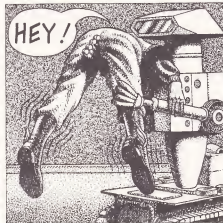
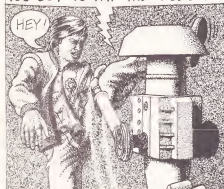
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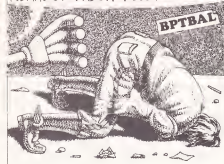
YOU GOT NO RIGHT TO ASK QUESTIONS, CHUCKO !



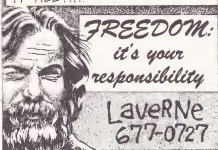
YOU WANT TO BE A CITIZEN,
YOU GOT TO PAY THE DUES !



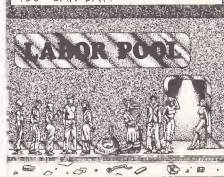
UNEMPLOYED CREATURES **MUST**
WORK. IDLE ENTITIES WILL
FIND ASSISTANCE AT THE
NEAREST **LABOR POOL**.



IT IS ALL, WE ARE TOLD, ON
THE STREET WHERE YOU LIVE.
THE STREET WHERE MARK
ONCE LIVED DOES INDEED TELL
IT ALL



... AND THE **LABOR POOL** PAYS
OFF IN ALL THE YEASTCAKES
YOU CAN EAT.



YOU DON'T BELIEVE ALFREDA'S
DEATH WAS A **COINCIDENCE**,
DO YOU ?

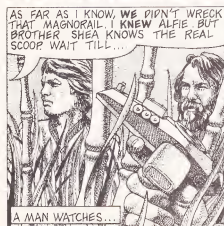
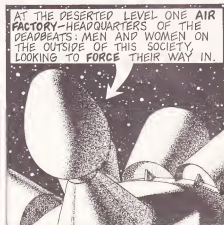
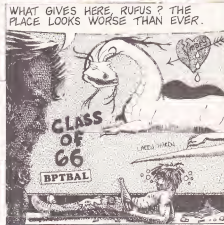
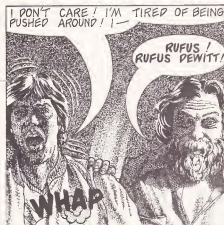


BUT THE POLICE ARE FOR WHO-
EVER **PAYS**, AND NOTHING, INC.
PAYS THE MOST. WHAT CHANCE
HAVE WE GOT TO FIND OUT
THE **TRUTH** ?



YOU OWE IT TO HER. WE OWE
IT TO **OURSELVES** ! WE'RE NOT
SLAVES—WE'RE **MEN** !







SILENT TRADE

D.C. and Lin Poyer

GOOD THING WE DIDN'T FIND IT ten years ago. We wouldn't have known *what* to make of it."

Dr. Lissa Karrin's sandals clattered down a set of crudely-nailed wooden stairs, under which dark mud oozed in the coldlight glare from overhead. Waldon, briefcase in hand, followed her through the twists and winds of the tunnel until it emerged into what he took for a moment to be the open air, so vast was the cavern. He stopped for a moment, and she turned, watching him with a slight smile as he looked out and down at the dig.

The floor of the cavern, some five hundred meters across, was of brownish-red sand, divided by stakes and twine into regular squares. In some of them men and women knelt, working close to the ground. They looked tiny under the massive vault above them, and Waldon frowned as he looked up at the ceiling. It was dark, glistening, and looked uncommonly smooth, as if the black fluid mud were held up by some invisible but unimaginably powerful bubble.

"The Field?" he said, pointing upward.

"Yes. At this depth it's holding up three hundred pounds per square inch. We run the generator from a five-horse portable engine. Thanks to the new technology."

She took him down into the dig, where a dozen tender-fingered graduate students crouched in the bottom of a shallow trench, brushing ancient dust from twisted metal ribs, unidentifiable fragments of what might once have been machinery, and patches of scarred, half-melted rock.

"It's a sizeable ship," said Waldon, looking around the dig.

"Sizeable? It's a monster," she said. "This area, where we're standing, is one of the minor machinery spaces. We think. There's a lot more of this thing leading off in that direction, outside the bubble. But we have struck on something interesting. If you'll follow me?"

Brushing past the "Good morning, Doctors" of the students working in the trench, she led him down a cut dirt step into a wider area, not as deep, but as yet only partially excavated.

"This area is what we're calling the 'hold', for lack of a better word. Might better call it the passenger deck, though, judging by what we found last week."

"I read the summary of your initial report. I'm now an archaeologist, but I gather you found some interesting bones."

"Yep, we did." Lissa, lightfooted, led him around berms and over twin section lines to the far corner of the excavation, not far from where the curving bubble met the floor. A small tanned man in wash khakis knelt at the edge of one of the berms, using a small trowel and whisk brush on a heap of brownish-white stone. He did not look up as they approached. Lissa stopped a few paces off. "Morrey?"

He looked up. "Ah, Lissa. Morning."

SILENT TRADE



Cortney Skinner

"Morrey, don't get up, but I'd like you to meet George Waldon, with the government. George, Dr. Morrey Sweet, Michigan."

"Pleased."

Lissa swept her arm round the twined-off area. "We took a flat forty square meters off here in one-centimeter levels. This is the floor of one of the lower decks of the ship. You can see transverse ribbing near where Dr. Sweet is working. This deck was divided into 3x3-meter sections by metal bulkheads. In each of them we found four sets of bones. Doctor?"

"Yeah, if you want to come over here, George..."

"I thought those were rocks," said Waldon. Over Sweet's shoulder he could see two small, scattered humps of stained bones protruding from the earth, seemingly melted into the reddish dirt.

"We've only excavated a few bones—whole skeletons—completely," said Lissa. "For analysis. These others are in pretty bad shape. You can see them right now, and if they're uncovered very carefully we can hologram them, but if we try to move them they're likely to crumble. Even with all this delightful new technology you've given us."

Sweet looked up, interested.

"Oh, no credit to me," said Waldon quickly. "I'm just a minor functionary, Dr. Karrin."

"Whatever," said Dr. Karrin. "Look, why don't you call me Lissa? Till later, Morrey." She took Waldon's arm and led him back out of the roped-off area. "Seriously, I do want to thank you—and the government. Wherever they're getting it, I mean wherever the Traders are from, this new technology is really helping us out. Chemical analysis, C-14 dating, photo-chronology, the whole shebang. So grateful."

"We're glad it helps, Lissa. And we do hear that a lot; if you think the archaeologists are happy, you should hear the

chemists and the physicists and especially the agricultural people."

"I can imagine. Chin Tszu—the man we sent the bones to for analysis—spends half his report enthusing over his new techniques. He's with that big lab in Chicago."

"Oh, yes. And how did those reports come out?" Seeing her guarded expression, he hurried on, "Look, I know you don't like to speculate about completely new finds. But my job is to find out as much about the Traders as I can. If this is a Trader ship, and if those skeletons can tell me what they look like, then I want to know."

"Frankly, Mr. Waldon"—the archaeologist's sunlined face was quizzical—"We are all a bit puzzled. Our first identification of the remains was as *H. sapiens Neanderthalensis*—typical of man perhaps 35,000 to 150,000 years ago. And Tszu agrees. Of course, he didn't know they were found in the wreckage of an ancient spaceship."

"But—"

"Confirmed the date by three independent tests."

"Oh, no argument with the date, uh, Lissa. I just find it hard to believe that these are *human* remains."

"So do I. The Traders would be aliens, after all—we wouldn't know what to look for. We do know what to look for in *Neanderthalensis*. What you seek, you tend to find. Tell us what one of the Traders looks like, and we'll be able to analyze the bones with a little more intelligence."

"As I said, Lissa, I'm just a minor functionary."

"Well." They reached the bottom of the wooden stairs. "Perhaps over dinner you can explain to me just what minor functions you perform."

Waldon bowed slightly. "I'd be pleased. We can take my helo back to the city."

[continued on page 37]

AND COME FROM MILES AROUND

Connie Willis

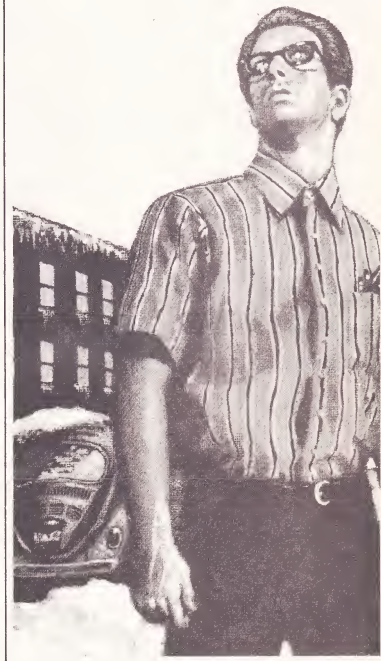
LAYNIE HAD TO GO to the bathroom again. Meg guided her through the crowded cafe to the back. The bathroom was crowded, too. Meg waited in the hall with Laynie. On the wall above the telephone, someone had written in magic marker, "Eclipse or Bust" and drawn a crude sun, a circle with uneven lines radiating from it. Under that someone else had scrawled in pencil, "It better not be cloudy. I came all the way from Houston."

When Meg came back to the table carrying the little girl, Rich and Paulos had both disappeared. Meg ordered Laynie another coke and stared out the window, wondering how long it would take a two-year-old to overdose on sugar. Emergency situations required emergency measures, and seven hundred miles in a car with Laynie was an emergency situation. With Rich's colleague, Paulos, along, Laynie could hardly be allowed to indulge in her usual trip behavior, which was to hang over the backs of their seats, shouting "cow" at regular intervals and dropping her gum down their backs. This trip Meg had sat in the back seat with Laynie and a litter of sticker books and doll clothes, popping lifesavers into her mouth every time she asked how much farther it was to Tana.

And now here they were in Montana, and the men had gone God knows where, probably back to the Chamber of Commerce to ask more obscure questions about f-stops and mylar filters. They had already been there once. Meg had stood in the slushy snow outside the crowded office while Laynie ran around and around the town's resident Air Force missile, screaming like a wild Indian. No one had paid any attention to her. They had clustered in little groups, reading over the free brochures and arguing about a line of miniscule clouds in the southwest.

They were clustered together on the streets, too. The locals were easy to spot. They were the only ones who weren't anxiously watching the sky. They were also the only ones not wearing T-shirts that said "Eclipse '79" in psychedelic orange and yellow.

The four men walking down the other side of the street were definitely not locals. They were all talking at once and gesturing wildly at the sky. Scientists, Meg thought. You can always tell scientists. Their pants are too short. These four all looked alike: short black pants, short-sleeved shirts with the pocket crammed with pencils and metal clips and a flat calculator. Short sandy hair and black-rimmed glasses. Heads of four science departments somewhere, Meg thought. *Scientificus americanus* in the flesh. They were obviously talking about the weather, even threatening it, from the look



of some of those gestures, although the sky was perfectly clear as far as Meg could see. And yet oblivious to the weather, too, standing there in the twenty-degree weather in their shirt sleeves. One looked dressed for an eclipse in Hawaii in a flower-splashed orange shirt. She would have thought they were in the wrong place altogether if Rich's coat hadn't still been slung over the back of the booth.

The men came back. Rich had bought a T-shirt for Laynie. She refused to put it on. "I think I'd better take her back to the motel so she can have some kind of nap," Meg said. "She's about done in."



Larry Benitez

Rich nodded. "You didn't bring any masking tape, did you? Some guys over at the Chamber of Commerce said an eye patch makes it easier to see the corona at totality."

"Maybe one of the drug stores is open," Paulos said. "The seminars start at two-thirty. Surely we can find a drug store open."

"What if we meet you at the seminar?" Rich said. He gave Meg the key to the motel room and took off again, remembering his coat this time. Meg struggled Laynie into her snow suit, paid the bill, and carried her back to the motel.

Two red-headed teenage boys were setting up an

Connie Willis

expensive-looking telescope in the parking lot of the motel. The "no vacancy" sign flashed on and off in the sunny afternoon. Laynie was already asleep against Meg's shoulder. She stopped to admire the telescope. The boys were from Arizona. "Do you know how lucky we are?" one of them said. "I mean, how lucky?"

"It does look like we're going to have good weather," Meg said, shielding her eyes against the sun to look at the clouds in the southwest. They seemed to be dwindling.

"I don't mean the weather," the boy said, with an air of contempt Meg was sure he didn't feel, not when he'd come all

the way from Arizona. "If we lived on Jupiter we wouldn't have this at all."

"No," Meg said, smiling. "I suppose we wouldn't."

"See, the sun is exactly four hundred times bigger than the moon and exactly four hundred times farther away. So they just fit. It doesn't happen like that anyplace else in the whole universe probably!"

He was talking very loudly. Laynie shifted uneasily against Meg's shoulder. Her cheeks were flushed, a sure sign that she was worn out. Meg smiled at the boys and took Laynie into the room. She turned back the red chenille bedspread and laid Laynie on the blankets, then kicked off her shoes and lay down beside her.

The boys were still outside when she woke up, loudly telling the landlady how lucky she was not to be living on Venus. The landlady probably already knew how lucky she was. Meg was relatively sure she didn't usually get to use her "no vacancy" sign in February. She was positive she didn't usually get thirty-five dollars a room.

Meg had a long chenille-nubbled crease down her cheek from where she'd slept on the folded bedspread. She combed her hair, pulled on a sweater, and sat down on the bed beside Laynie. It was only a little after two. The seminar was supposed to last two and a half hours, with a film at three o'clock. There was no way Laynie could last through the whole thing. She might as well let her sleep.

Laynie was staring at her wide-eyed from the bed. "Tana?" she asked sleepily.

"Yes," Meg said. "Go back to sleep."

Laynie sat up. "Clips?" she said, and crawled off the bed.

"Not yet. Would you like to go swing? Let's get your boots on."

The red-headed boys were gone from the parking lot. They had probably gone to the seminar. The landlady directed Meg and Laynie to a park two blocks off the main street. Meg walked slowly, letting Laynie dawdle over a puddle and poke at the piles of dirty snow with a stick she found. On the way, Meg saw the four scientists again. She was relieved to see they were no longer running around without coats. They were all in parkas now and had an assortment of hats, among them an enormous Stetson and a red wool deerstalker with ear flaps. Protective coloration, Meg thought. Now they looked like everyone else. It didn't really matter what they wore, though. They could be wearing clown suits for all anybody would notice. The locals only looked at your money, and everybody else was watching the sky.

They were still arguing fiercely about the weather, almost frantically, although Meg couldn't make out what they were saying. It sounded a little like a foreign language, though Meg couldn't be sure. Scientists talking to each other always sounded a little like a foreign language.

There was no one in the park. Meg wiped a swing dry with the tail of her coat and set Laynie gently going back and forth. She made a circuit of the park, avoiding puddles, and thinking it was an awfully small town to have two missiles. This one was not anything like the needle-shaped red, white, and blue one the Chamber of Commerce had. It was short and squat and a painfully nondescript pale khaki color. Army surplus. It had no markings to identify it, but along one side were long, scraggly marks that looked as if they had been scrawled in charcoal. Local graffiti, Meg thought, and moved closer.

It wasn't graffiti unless it had been put on with a blow-torch. The long row of hash marks had been burned onto the side of the missile. They were slightly uneven in length: Laynie's idea of writing. At the end of the line was a circle with more hash marks radiating from it. The circle reminded her of something, but she couldn't think what.

"Rocket," Laynie said.

"No, honey, it's a missile." Actually, it did look a little like a rocket.

"Rocket," Laynie repeated. She was standing behind Meg, in a puddle. Meg couldn't see the tops of her boots.

"Oh, Laynie," Meg said. "Your good boots!" She helped her out of the puddle.

"Boots!" Laynie wailed. "Wet!"

"Oh, honey," Meg said, and picked her up in her arms. "Let's go change into your sneakers, okay? Your pretty red sneakers, okay?"

Laynie sniffed. "Wet."

"I know." It seemed like a long way back to the motel. "Let's pretend we're in a rocket," Meg said to distract Laynie. "Where shall we go?"

"Tana," Laynie said.

"Montana?" Meg laughed. "Why?"

"See clips," Laynie said solemnly.

Meg stopped in the middle of the street and looked back at the park.

BY THE TIME MEG GOT LAYNIE into dry socks and the red sneakers, it was nearly three-thirty, which meant the questions should be over and the scheduled movie started. Laynie was very good in movies, no matter what they were about, so Meg decided to risk meeting Rich. Thank goodness it was a little town. The high school was only two blocks farther than the park, perched on the top of a hill. The Chamber of Commerce had recommended it as the best viewing site for tomorrow.

Meg had guessed wrong about the movie. They were still asking questions. Rich and Paulos were halfway down the auditorium and halfway into a row. Meg decided against trying to get to them and sat down in an empty seat almost at the back. She helped Laynie out of her snow suit and handed her a package of gum.

"Clips?" Laynie asked.

"Not yet," Meg said, "but there'll be a movie soon." I hope. She tried to tell from the questions being asked how near they were to being finished, but it was impossible to tell anything. The questions were a jumble about shadow bands, welder's glass, mylar film, Bailey's beads. Meg had the feeling from the look on the face of the man leading the discussion that some of the questions had been asked before. He was probably a teacher, because he didn't know how to hold the microphone right. He was certainly a scientist. He had a calculator and five pencils in his shirt pocket. His pants came almost to the top of his socks.

Meg wondered idly where her four scientists were. She didn't see them in the crowd, though there were several Stetsons and one fluorescent orange deerstalker. And a million parkas. If Holubar were sponsoring the eclipse, Meg thought, this is what it would look like. Laynie stood on her seat and offered gum to the elderly couple behind her.

The science teacher finally stopped one of the red-headed boys in mid-question and started the movie. It was a National Geographic film of an eclipse out in the ocean somewhere. The scientist who did the narration was the spitting image of Meg's four. He even had on an orange-flowered Hawaiian shirt. He talked for fifteen minutes about the mechanics of eclipses while Laynie stared raptly at the screen, not even chewing her gum.

"The fact that solar eclipses occur at all is due to a coincidence unique in the solar system—as far as we know, unique in our whole celestial neighborhood. It's all due to the diameter of the moon, which is three thousand four hundred eighty kilometers, being point oh oh two five times the diameter of the sun, which is..." He was off again, working out chalky equations. Laynie loved it. The gist of it, Meg gathered, was not that there were eclipses, since everything in the universe must sooner or later manage to get in the way of everything else and ruin the view. The amazing coincidence part was that the sun and the moon were an exact geometric fit, so that instead of just darkness there were the

AND COME FROM MILES AROUND

corona, the prominences, all the show that people came from miles around to see.

Laynie had to go to the bathroom. Meg trekked her down a locker-lined hall and nearly collided with her scientists. They brushed past her and out a side door onto the school's tennis courts. The courts were heaped with black snow, but they commanded an unbroken view of the sky.

Meg could see now what they had been arguing about. The sky was still clear, with only a few delicate cirrus clouds above the dipping sun, and that threatening line of clouds had disappeared. But there was a faint haze to the west that Meg recognized now as weather coming. A big front, too. It might be overcast by as early as tonight. So why weren't the four worried?

They did not look worried at all. The argument was coming near to being resolved, Meg thought, watching them through the door, because their expressions were nearly in agreement and their gesturing was on a smaller and more soothing scale. In fact, Meg thought, they looked a little smug, like Rich and Paulos when they had found the mistake in the program and could now go full speed ahead without interference. She wondered what the weather report for tomorrow would be. I don't need to hear, she thought irrationally, I already know. She watched them through the door for a few more minutes and then took Laynie to the bathroom.

The questioning in the auditorium went on for almost another hour after the movie, during which time Laynie went through two more packs of gum and a roll of lifesavers the old couple behind gave her. Meg decided they were saints sent down from heaven to help young mothers through the eclipse. If heaven wasn't too far to come, Meg thought idly while the man with the microphone held forth on the construction of a pinhole viewer from a shoebox, how far was too far to come?

Everyone who had been in the auditorium was in the cafe and then some. The special was something called an "eclipse burger," which turned out to be a hamburger with a fried egg and cheese on top. Laynie took the top bun off and refused to eat anything else. Rich and Paulos talked about the weather while Meg scraped egg and cheese off Laynie's hamburger. They hadn't noticed the haze yet.

"Do you realize how far some of these people have come?" Rich said. "That guy that was sitting next to us was from New York. He *drove* out."

"Yeah, if it's cloudy tomorrow, there are going to be some mighty unhappy people," Paulos said.

"Ick," Laynie said, pointing to the yellow mess beside her hamburger. Meg scraped the offending goo onto her own plate.

"It seems to me," she said, "that if you had come far enough you would have some way of ensuring that the weather was clear." She put the top bun on the hamburger and handed it to Laynie. Rich and Paulos were looking at her as if she had lost her mind.

"You mean cloudseeding?" Rich said finally.

"I just... exactly how far do you think people actually come to something like this?"

They looked at each other. "I don't know," Paulos said. "There are supposed to be some astronomers here from Italy."

"Are there four of them?" Meg said without thinking, and then stopped. They were looking at her again. "But they don't have to come, do they? I mean, I thought scientists could see everything they wanted to with the satellite equipment. The corona and all that, I mean," she finished weakly.

"Catch up," Laynie said. Meg handed her the catsup bottle. She wouldn't be able to get the lid off and it would keep her occupied.

Rich was still frowning. In a minute he would ask, "What's the matter?" and she would say, "There are four scientists

here who aren't from Italy," and then he would really think she was crazy. But he was frowning about something else.

"You know," he said thoughtfully, "somebody else was saying that same thing this afternoon, that with all the above-the-atmosphere equipment we've got now, there's really no reason for all the elaborate set-up every eclipse."

"Then why do they come all the way from Italy?" Meg persisted. She was not sure what she wanted him to say, perhaps that the distances were dwindling, that nobody came very far any more just to see an eclipse.

Rich hesitated. "They just... I don't know."

"They come to see the show," Paulos said suddenly.

"Ick," Laynie said.

"They come for the same reason the pilgrims went to Canterbury, Teddy Roosevelt went to Yellowstone, the astronauts went to the moon. To see the show."

"Well, but surely it's more than just that. Scientific curiosity and—" Rich said.

"Protective coloration."

Meg sucked in her breath.

"But there's still a lot of information that can't be gotten any other way," Rich said. "Look at—"

"Ick," Laynie said again. Meg could not see Laynie's plate under the catsup. She had apparently gotten the lid off quite easily.

After supper they went back to the motel. The men stood outside with the red-headed boys and debated the weather. The faint haze had become a light film nearly obscuring Jupiter, although the moons could still be seen faintly through Paulos's telescope. Meg gave Laynie her bath and put her to bed. She washed out the catsup-stained T-shirt and the mud-soaked socks and hung them over the shower curtain rod in the bathroom. Then she got ready for bed herself and flicked on the TV.

It was a Helena station. Helena was worried about early morning fog. They were recommending Lewistown and Grassrange. Apparently Helena hadn't noticed the haze, either. There was a guest meteorologist from Denver. He explained how the Russians had used cloudseeding during the last eclipse to obtain a perfect view through dense cloud cover; and that modern technology had not developed to the sophistication necessary for weather control in the northwest due to complicated arctic flow patterns, but plans were already being made for the eclipse in Hawaii so that hopefully they would be able not only to predict but guarantee good weather to the people who had travelled so far to see this wonder of nature. Meg turned off the TV and went to bed.

S HE WOKE UP AT FIVE-THIRTY, frozen stiff. The door of the motel room was standing open. She pulled on her coat, pulled the covers up over Laynie, and went outside. It was just starting to get light. Rich and Paulos stood with their hands in their pockets, looking miserable. The red-headed boys had the back of their orange hatchback open and were slinging sleeping bags and equipment into it. The sky was completely overcast.

"Where are they going?" Meg asked Rich.

"Helena." He sounded grim, which meant he was frantic with worry.

"But Helena's supposed to have fog."

"Fog might burn off. This..." He waved a hand at the sky. It was getting lighter by the minute. The clouds looked totally impenetrable. A major front. "What do you think, Paulos?"

"I think if we don't make up our minds within the next few minutes it'll be too late to make any difference. We've only got about two hours until it starts."

The red-headed boys came out with a last load. Two backpacks and the camera tripod. They threw them in the back of the car and slammed down the hatch. One of them had drawn "Eclipse Special" with his finger in the mud on the

back window. Next to it he had drawn a sun. A circle with uneven lines radiating from it.

"I say Helena," Rich said.

"Great," Paulos said, and turned back to the motel.

"No," Meg said.

They all looked at her, even the red-headed boys. They will never forgive me if it's cloudy and they miss the eclipse, she thought. It's the last one in North America in this century, and they will never forgive me. But Helena has fog and we have...

"No," she said again. They were waiting for her to explain, and to explain would be disastrous. "There's no need to go anywhere," she said clearly. "We'll be able to see the eclipse from here."

"How do you know that?" Rich asked.

"I know it." Her tone sounded convincing even to herself. The red-headed boys looked almost persuaded.

"How do you know it?" Paulos asked. Woman's intuition?"

She almost said, "There's no such thing and you know it," but the boys looked as if they might believe that. They were only eighteen. Emergency situations demand emergency measures. "Yes," she said. "Woman's intuition. It's going to clear off in time to see the eclipse."

"All right," Rich said, "we stay." The boys looked at each other, nodded their heads, and started hauling their stuff back out of the car. Rich took Meg's arm and led her back toward the motel room. "Meet you for breakfast in fifteen minutes, Paulos," he said.

"Yeah," Paulos said, laughing. "That's one benefit of staying here. We get to eat."

Rich shut the door behind them. "Woman's intuition," he said. "You know something, don't you?"

Meg looked at him steadily.

"You've seen something?"

Yes. Dead marks on a car. Two missiles in a town the size of a pinhole viewer. Four scientists who look so much like scientists they could have been copied out of a National Geographic film who aren't even worried about this storm. A child's drawing of the sun. Laynie. Yes, I've seen lots of things. But I'm the only one. Who's going to notice four scientists in a town full of scientists? Who's going to notice that they're speaking some strange foreign language? Everybody's speaking science, and nothing's stranger than that. Who's going to notice anything? You're all looking at the sky. She kept silent.

"How on earth can you believe that mess out there is going to clear off by eight-thirty?"

"Clips?" Laynie said from her bed.

"Clips," Meg said firmly. "Let's get your clothes on so we can go eat breakfast."

They set up in front of the high school. Meg did not see the four anywhere. It was not even possible to see the sun's disk through the gray blanket of clouds, though it was possible to get an image through the telescopes.

"We have contact," one of the red-headed boys said at 8:21, and there was some scattered applause.

"Sun?" Laynie asked.

"Behind the clouds," Rich said.

Everyone was going through the motions of setting up telescopes, cameras, binoculars for projecting an image on the snow. Nobody looked at the sky. The elderly couple let Laynie look through a pinhole viewer made out of an oatmeal box, even though there was nothing to see.

Meg walked Laynie around the outside of the high school and told her all about not looking at the sun unless she had her special glasses on that Daddy had made for her. At 9:04 she found her scientists where they had been before, on the tennis courts around the side of the building. They were setting up their equipment, most of which was short, fat, and

the same faded khaki as the missile in the park. They were all talking animatedly at each other and nodding at the sky.

At 9:05 the clouds around the sun began to be pushed away in a ragged circle and the sun's disk began to shine very thinly through. Meg made Laynie put her special glasses on. At 9:17 the sun came out and everybody cheered. Meg walked Laynie back around to the front of the school where Rich had the telescope set up. Rich looked frantic, which meant he was hopeful. He and Paulos were wearing eyepatches made of kleenex and masking tape. It began to get dark in the west, a purple-blue darkness like a summer rainstorm. Meg looked through the telescope at the last sliver of the sun, still shining too bright to look at in the now completely blue eastern half of the sky.

A 9:24 Paulos said, "She's a-coming." Meg picked Laynie up and started edging away from the men in the direction of the tennis courts. It began to get very dark. Laynie clung to Meg's neck and squeezed her eyes shut under the mylar glasses. Shadows rippled suddenly over Meg like a shudder. She looked up.

And was caught by the eclipse. There was a flash, like the captured light from a diamond, and then it was there, suspended in the sky. The sky was not totally dark. Reflection from the snow. The science teacher had explained it yesterday in the auditorium. He had not explained how beautiful it would be. The sky was a dawn blue with pink shining from the retreating clouds like a coming sunrise. In the center of the fragile blue the sun flared out on all sides from behind the moon.

Meg pried Laynie's arms loose from around her neck and took her glasses off of her. "This is it, Laynie honey," she whispered. "Look at the clips."

Laynie turned around shyly, as if she were being introduced to someone. "Oh," she said in a tiny voice, and stuck her finger in her mouth. Her other hand she kept tight around Meg's neck.

"Twenty-nine, twenty-eight..." One of the red-headed boys was counting backwards. It could not possibly have been two minutes already. A fine line of light appeared at one side of the bluish circle. "That she goes!" somebody said. Meg shoved Laynie's glasses back on her and looked down at the snow. The sun flared back into blindingness and there was a tremendous roar of applause.

The red-headed boys pounded Meg on the back. "Boy, was that ever neat!" they kept saying. "Boy, are we ever glad we listened to you."

Rich grinned at her. "You've set women's lib back a hundred years," he said, and squeezed her hand.

"Quite a show," Paulos said, rocking back contentedly on his heels, "quite a show."

"Oh," Meg said, and took off through the forest of tripods with Laynie still in her arms. They were already gone, the four of them carrying their equipment down the hill. There was probably time to catch them before they made it to the park. I didn't want to catch them, Meg thought. I just wanted to see what they thought of it, if it was worth it, coming all this way. Their gestures had taken on grandiose proportions. Meg decided it must have been.

"Laynie had to go to the bathroom," Meg explained when they got back. The air had turned chilly. Meg put Laynie's hood up.

"Ten degree drop in temperature during the eclipse," Paulos said. "It looks like it's turning bad again, too." He got into the car. The even layer of clouds was pushing steadily back over the sun.

Meg settled Laynie in the back seat and then helped Rich get the camera tripod maneuvered into the trunk. "You're not going to tell me, are you?" Rich said.

Meg looked at him. "Tell you what?"

He slammed the trunk shut. Meg got into the back seat with Laynie. Rich started the car.

"I sure would like to know what you did back there," Paulos said. "That was some weather predicting."

"Um," Meg said. She was straining to see the park as they passed the side street she and Laynie had walked up.

"Rocket," Laynie said. "Rocket. Tana. Clips."

"What, honey?" Rich asked.

Emergency situations demand emergency measures. Meg popped a lifesaver into Laynie's mouth. —G—

SILENT TRADE

[continued from page 31]

IN THE COLDLIGHT OF THE DIG her hair had been pale yellow. In the candlelight of the Harbor Inn, it glowed like a hoard of gold coins, and her tanned face looked years younger. In the private atmosphere of a corner booth it was not hard for Waldon to talk about himself and his job.

"When we first made contact with them, the government was pretty hush-hush about it all. Still is, of course. New York started a special unit—Extraterrestrial Relations—to set up the Trading and to prepare for diplomatic ties, cultural exchanges, and so forth."

"I didn't know we had diplomatic ties."

"We don't." Waldon shrugged, stopped suddenly as the waiter rolled a large tank on wheels over to their table. "Shall I choose for you, Lissa?"

"Yes, a small one, please."

Waldon pointed to two of the lobsters more or less at random. The waiter reached in with tongs and placed them, antennae wriggling desperately, in a separate compartment and wheeled the cart away. Waldon turned back to Lissa. "We don't. In fact, we've never seen an alien; we've only talked to them via the radiotelescope at Paracibo. That's why the government is so interested in your find. This dig is the closest we've come to meeting them in the flesh. That ship is a freak, an accident, a stroke of luck. We never see them and they never see us, though obviously they visited Earth in the past."

"How do we trade with them, then?"

Waldon covered his momentary hesitation by pouring the wine. "Well, this is confidential. But I understand the anthropologists have a term for what we do. It's called a 'silent trade'."

"I recall that. The classic example is the Mbuti Pygmies, who live by hunting in the jungle. Their neighbors, who are farmers, need the game the Mbuti can provide. The farmers leave grain and vegetables at the edge of the forest. Later, the Mbuti come to this prearranged trade site, and, if the price is right, they take the food and leave freshly-killed game in exchange. Each group has something the other needs, but they can't—or won't meet face to face. So—silent trade. No contact, no tension, no cultural exchange."

"That's essentially it. We leave our stuff on the far side of the moon. A month or so later the Earth has a new satellite. We send a shuttle up and tow down twenty-some tons of goodies."

They were interrupted by the arrival of their lobsters. Lissa toyed with her fork. "A space ship wrecked 60,000 years ago off the Great Barrier Reef. A crumpled, rusted hull, disintegrated equipment, and a few fragile bones that look for all the world like human. . . I guess we won't be much help to you after all."

"Anything helps," Waldon said.

"Do you really know nothing about them?"

"I don't, let's put it that way. I suppose the higher-ups might, since they put together all the little clues we pick up." Waldon fell silent, remembering razor-bladed pages in reports, glances between senior colleagues, hints of things that he was too junior to be allowed to know. A lot of red folders passed his desk unopened on their way to the top office.

"You know, I sometimes wonder—" she began.

"Go on," he said, looking up from his lobster.

"Well, if there isn't something...you know, odd going on."

"How so?"

"For instance, all this secrecy. I mean, the UN is supposed to handle things for the good of the people, right? So why not just tell them all about the Trade? Why keep it so secret?"

Waldon considered. "Maybe they don't want any bad feelings to start. If anything happened to interrupt or stop the Trade, we'd be—" he stopped, but too late.

"We'd be what?"

Waldon had a strong feeling of spilling the beans. This whole affair of the Trade was classified. But the wine was warm in his veins, and Lissa's hair was golden in the candlelight, and he had already told the helo pilot that she would be spending the night with him. Besides, she was working on a government project, and she must have been cleared as a routine security measure. So he explained.

"The truth is, Lissa, we wouldn't be afloat without the Trade. Earth wasn't meant to support a population of eleven billion; you might say we're running out of everything but people. Without this new technology there would be famine, riots, war, disease. . . disaster. We can't afford to do anything that would turn the public against it."

"So it's kept under wraps."

"Right."

"Well, I don't quite see the relationship, but all right." She sipped wine for a moment and Waldon felt her eyes boring into his.

"George."

"Yes, Lissa?"

"What would happen if they found out you told me that?"

Oh, Jesus, he thought. "Well. . . they wouldn't like it."

She smiled. "Don't worry. I won't report the minor malfunctioning of a minor functionary. In fact, I'm honored."

"I'm glad of that. That you feel honored."

"Don't be an ass. You're glad I'm not going to turn you in. Well, I'm not. Instead, I'm going to show you something." She reached for her purse and slid out a long manila envelope. "Something that I think will interest you very much."

Waldon briefly debated not opening the envelope, but his curiosity got the best of him. He spread the sheets of the report out on the table and began reading. The waiter came by, but Lissa waved him away. At last Waldon looked up. "This is fascinating," he said. "This 'pilot's compartment'—that's a separate part of the ship?"

"Yes."

"But what you found there—amazing! Cartilaginous traces. The teeth—fascinating, but horrible, too. Have you any idea what they looked like?"

"We have a composite reconstruction on the last page of the report."

Waldon turned pages, stopped. Paled.

"Jesus," he said. "This is a Trader? No wonder they don't want us to see them. But they're terrifically advanced." Waldon tapped the crystal of his wineglass. "We can't even figure out what some of the gadgets they send us are made from. They don't seem to use iron, nickel, aluminum, even plastic or gastron. . . no raw material we can name."

Lissa put down her fork. "Or provide in exchange."

"What do you mean?"

"I mean—it just occurred to me. Probably a silly question. What do we trade to them in return?"

Waldon also set his fork down on his plate, gently. In the candlelight his eyes widened to meet her stare. Waldon's fingers were frozen to the stem of his glass, and he felt ice along his spine.

It was Lissa who finally spoke, in a hoarse whisper. "Waldon, for God's sake...what do we give them in return?"

—G—

I DEMAND THE STARS FOR MY CHILDREN!

Susan Lull



IT WAS 17 DECEMBER 1903. The snow fell in great flakes on the frozen torrents of Niagara Falls. I didn't see it—I was too mad. I cried at the indignity I had just suffered. . . . cried and cried and cried. . . .

"Good," said the Doctor, "A nice healthy daughter, Mrs. Lull." Mother raised her exhausted body and rested on her elbow as she looked out at the snowdrifts glistening like white sand dunes in the shining moonlight. There was a soft glow in the eastern sky—day would soon be starting.

"Daybreak, Orville," said Wilbur. "Got to get going before the winds get too strong. Looks like a good day for flying." He raised the shade and looked out at the white dunes of Kitty Hawk. He glimpsed a distant flashing of wing, a tiny sharp-tipped point of feather that soared and turned in the morning light. It soon would be replaced by a quivering contraption made of wood, fabric, and courage that would take the human race into the heavens.

The world around me was interesting and I wanted to explore it, but I was just a girl.

"Girls don't play with watches," said father in a kindly way as he carefully extracted the mysterious ticking machine from my eager, pudgy hands.

"You'll fall and hurt yourself," my mother protested as she directed my father's dismantling of my first attempt at a tree house.

"No, you can't go to Albany with your father and brother to watch Glenn Curtis take off for New York City."

Mr. Curtis made it—non-stop—and won a \$10,000 prize. Those were the days when \$10,000 was enough to start an aircraft company. My friend's father worked at the Curtis Company in Buffalo. When I was 14 he arranged for both of us to take our first ride in an airplane. The thrill of flying above the clouds sent my soul soaring. I felt as if I could do anything! But in fifteen minutes my feet and spirit were back on the ground, held there firmly by the enervating pull of gravity.

The Girl Scouts came to the rescue. I would endure my months-long imprisonment in school knowing that soon I would start my many weeks of freedom in summer camp. We Girl Scouts didn't get to do the really fun things—like axe throwing contests—that the Boy Scouts in the camp around the lake could do. But there were many unforgettable moments: My first canoe paddle—laboriously whittled out of a birch plank. The bird-like view from the peak of Eagle Mountain—how I wished I could have soared back down over those slopes that I had so laboriously climbed. The races—hunched over the bow of a canoe, my paddle dipping into the shining, flawless sky of the lake. I felt as if I were

back flying again in that Curtis trainer.

It was late in the summer of 1918 when the camp counselor called me in to give me the news. My big brother, fascinated with airplanes since that first visit to Albany, had volunteered for the Army Air Corps. He had been sent with the American Expeditionary Force to fight in France. His plane had gone down somewhere over the Marne. I spent the rest of the day on Eagle Mountain, watching the soaring birds through blinking eyes. . . .

I got married the week Lindy flew across the Atlantic. My husband and I used to joke about naming our first child Charles after Lindbergh, but it was no longer a joke after the tragic loss of Lindy's child. We named our boy Robert, after his father. Five years after Robert, my Amelia was born. The world had lost one Amelia that year and I tried to make up for it in the only way I could.

When Pearl Harbor came, my husband attempted to join the armed forces. They told him he was too old to fight and sent him back to his job of making radios. As the war dragged on, he found himself working on the new top secret radars. He finally got his wish and went overseas to Britain, where he installed the radar detection systems that helped the RAF pilots defeat the Luftwaffe and the buzz bombs.

The German V-2 rocket weapon scared me. I feared that America was going to lose to an onslaught of Nazi missiles that blasted their way into outer space, to come dropping down out of the blackness onto any point on the globe. Fortunately, the rockets couldn't go very far, just across the Channel. But that was enough, two days before D-Day, A devastating blast from a V-2 took my husband from me.

Why must we always take our greatest accomplishments and use them to kill each other?

My two children slowed me down some. But the year after my son Robert went off to graduate school, Amelia got out of high school; then she and I both blossomed. She became a stewardess and introduced me to the joys of transcontinental flight—looking down from heights taller than the tallest mountain. She was just like me, always wanting to know how things worked—and insisting on finding out the answer herself. Our first quest was to learn how to fly. We got our private licenses at the same time (but I soloed first).

A baby slowed her down a little, too. When my granddaughter came, I visited Amelia's home in California to help take care of the new arrival. In the wee hours of the morning, in early October 1957, I was up; walking back and forth with my cranky granddaughter on my shoulder. Fortunately, there was an early morning program on the local

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THE COURT OF THE TIMESIFTERS

Mary H. Schaub



HE CLINGING FOG that had persisted all morning condensed at last into a cold drizzle which found its relentless way down Ames's neck no matter how tight he pulled his hooded cloak. Ames renewed his vow to make Landar his third and positively last stop on this pestilential planet. As he made another fruitless attempt to achieve a comfortable position on the narrow, highbacked saddle, a veritable rivulet coursed past his collar. Ames was tempted to shout a few well-chosen words into the closest ear of his mount, a lumbering, brown-haired werbel, but he knew that, if possible, it was even more ill-tempered than he was. He didn't care to startle the creature and find himself pitched into the mud. Riding, he concluded grimly, was still better than walking, given the foul weather and the even fouler state of the roads. Roads—meandering cart tracks was a more appropriate description.

On the whole, Das tended to be a dry planet. Ames had come prepared for semi-desert climate, but some careless authority had neglected to inform him that a brief rainy season currently prevailed in these latitudes.

Ames sneezed, and jerked his sodden cloak tighter. Ah, the romantic life of the professional archivist, he thought, cataloguing the supposed attractions: travel to distant planets, cooperation with representatives of alien cultures, opportunities to delve into the pasts of countless worlds, broadening humanity's understanding of the inhabited galaxy. To be fair, Ames admitted to himself, there were compensations to balance the long hours of tedious data tape correlation. Field excursions like this one, for example, provided a welcome respite from computer work. So far, however, this trip to Das had been a monumental disappointment.

Ames had known when he accepted this assignment that Das was a static world whose inhabitants stubbornly resisted change.

As his werbel plodded through a particularly large, icy puddle, Ames cursed the Dashan law against the importation of any self-propelled vehicles. Still, he reminded himself, some of his colleagues considered him lucky to be allowed on Das at all.

For many standard years after First Contact, the Dashan had refused to let Outsiders stay on the planet, except for the few diplomats they tolerated—and isolated where they could not contaminate Dashan Tradition. Gradually, the restrictions were relaxed enough to permit a few Outsiders in to conduct business, for next to their unswerving commitment to preserve traditional stability, the Dashan had a passion for trade. The more complicated the transaction, the better. Outside historians had frequently compared this absorption with trade to the Dashan fondness for their native game *kirim*, which was to be found in multiple variations all over the planet. Ames tended to be skeptical of the comparison, for he had yet to find a single non-Dashan who could explain just what was the point of *kirim*. He had hoped to clarify the matter firsthand when he reached Das, but so far, although he had observed countless games in progress, Ames was no closer to understanding the objective of *kirim*, and what, if any, rules were involved.

To take his mind off the miserably wet present, Ames was mentally outlining a scholarly report on the utter incomprehensibility of *kirim* to the human mind when he realized that he was hearing more splashes than could be accounted for by his own werbel. He looked back over his shoulder. Once he wiped the rain out of his eyes, he could see

Mary H. Schaub

that another mounted traveler was hastening along the road. Earlier in the day, just after Ames had left Takla, he had passed a pair of Dashan Guardians—the local equivalent of police—inward bound toward the city, but this lone rider was the first person that Ames had sighted since the rain began.

As the distance between them lessened, Ames could see that the traveler was in an urgent hurry. He was not surprised to discern that the rider was a Dashan; the odds against meeting another Outsider were overwhelming. Quite unexpectedly, the Dashan gestured for Ames to rein in his werbel. It was evident that the alien desired to enter into conversation. Ames suppressed a sigh. He couldn't look forward to a lengthy, polite colloquy conducted on an otherwise deserted road while the cold rain drenched him further.

All the advice he'd been given by the so-called experts on Das, however, stressed the vital importance of complying with Dashan custom. Next to the intricacies of trade and *kirim*, the Dashan relished conversation. Ames had already witnessed a stupefying blur of conferences, with varying numbers of participants bobbing their heads rhythmically at one another like so many tall, graceful plant stalks. He remembered part of a botanical data tape he'd scanned recently on the flora of Jaris IV. One plant in particular reminded him of conferring Dashan—"nodding monarchs," that was the name. It was doubly appropriate as well in its suggestion of dignified reserve, for the Dashan were a placid, generally serene species.

Talkative, too—at least to each other. Ames, who had a useful talent for languages, had learned to read Standard Dashan some years before. Speaking it, unfortunately, was another matter. Dashan physiology heightened the pitch of their voices; consequently, diplomatic courtesy required Outsiders to try to match those tones. At least there was no worry about encountering unfamiliar "modern" expressions. While most cultures instituted periodic language reforms, the Dashan made sure that their language remained essentially unchanged, in order to transmit Tradition properly.

Ames reined in his werbel and looked up at the solemn, oval face swaying politely in the opening Ritual Gestures upon Meeting with a Stranger. For a Dashan, however, this individual appeared unduly agitated, Ames thought. Its round, leaf-green eyes were wide open, a sure sign of excitement. When the Dashan rattled through the first Four Symbolic Observations at top speed, Ames knew that this was indeed an unusual occasion.

"Stranger Who Comes from Afar," the Dashan continued in a reedy voice, "This person is Faldar, a Merchant from Takla. Learning of your presence from a passing Guardian, this person has pursued you. It is my Obligation this day to begift you."

Startled, Ames leaned back in his saddle, groping for a proper response. "My Cup of Honor overflows at your Intention," he squeaked, straining to achieve the high pitch expected in courteous speech. "To be allowed to travel on your World is Gift enough."

The Dashan nodded brusquely, evidently anxious to hurry the ceremony along. Slipping a delicate four-fingered hand inside its cloak, it withdrew a dark green circular object thraded on a fine metal chain. "Accept this Gift, given freely," it recited in a rush, extending the pendant to Ames. "This Gift of Das must be willingly received."

The human ransacked his memory. He had never read, seen, or heard of any Dashan gifting custom like this. Fearing

that hesitation might be considered unpardonable ill manners, Ames reached out a gloved hand to accept the pendant.

"I command few Expressions suitable to convey the extent of my Gratitude," he began, but the Dashan interrupted, compressing the Four Revered Exhortations upon Leavetaking into such a rapid gabble that Ames had no chance to insert his Six Customary Rejoinders. With a final hasty nod, the Dashan wheeled its werbel and rode away through the slanting rain.

Ames stared after it, then examined the unforeseen gift. It seemed to be made of some kind of dark seamless shell, with an interlaced decorative pattern on the upper side nearly smoothed away from wear. He flipped it over. The back was plain, a glistening dark green shading to black on the rim, smooth except for a few random grooves generally oriented toward the center.

"I'm not getting any drier sitting here," he observed loudly to his werbel, which, after the manner of werbels, had taken the opportunity to doze while its rider thoughtlessly allowed it to stand still. Ames prodded the beast with his boot heels. Dashan riders had never needed to invent spurs, their own unshod, birdlike feet proving quite adequate for the purpose. With an unwilling grunt, the werbel lurched into motion while Ames considered what to do with his gift.

"I may as well wear it," he decided. "I can't get much wetter than I am already." He pushed back his hood and slipped the chain over his head, settling the pendant inside his soggy tunic.

As it made contact with his skin, a small, musical voice abruptly remarked in Dashan, "Greeting. You are my new Owner."

Ames twisted around, trying to locate the speaker, but the muddy track stretched empty in both directions. "Where are you?" he called, peering to either side, where an army could easily have concealed itself among the thick tasselbranch shrubs edging the road.

"Within the pendant," answered the voice.

Astonished, Ames snatched at the chain, jerking the pendant out into the dim light. It must be a communications device, he reasoned, although no such device should exist here, not in private hands. The Dashan governing body, the Grand Conjunction, had conceded that swift communication improved trade, so they allowed the installation of a network of comlinks among the major cities. Use of the links, however, was firmly restricted to qualified merchants. Ames had never heard of any portable com device belonging to a private Dashan citizen, certainly not a self-aware unit capable of independent speech.

"What kind of device are you?" he asked the pendant, feeling somewhat ridiculous to be talking to an inanimate alien artifact. He soon felt more foolish, for there was no reply. He shook the pendant gently, and tried speaking to each side of it with no result.

"Bare skin!" he exclaimed, after a moment's thought. "It was touching my chest before, and now I'm handling it with my gloves on. It must be activated by a galvanic response sensor."

With some difficulty, he wriggled his right hand out of its wet glove and grasped the pendant. "What sort of device are you?" he repeated. He was both pleased and unenlightened by the reply.

"I am a Zlin," said the voice promptly.

"Just what is a Zlin?" inquired Ames, recalling no such

term from his briefing.

"A Zlin is a Decision Maker, a Provider of Advice. Have you no such things in your region?"

"No," said Ames, "I don't think so. We use computers—machines—to process data, but we make decisions after studying the findings."

"You are *not* Dashan," announced the voice.

"I am a human, a visitor to Das."

"Human," said the Zlin reflectively. "A previous Owner once met two humans. They encountered much excitement while in company."

"You say you make decisions and offer advice," pursued Ames. "Under what conditions?"

"Sentient creatures experience many occasions each day when trivial decisions must be made—which garment to wear, which food to choose, which Gesture to make. A Zlin provides useful advice, drawing upon Revered Custom, freeing the Owner to devote its energy to matters of greater substance."

"What if I choose to ignore your advice?" asked Ames.

"That is your privilege. A Zlin seeks to satisfy the Owner's needs. A Zlin desires to be of service."

Ames thought of the curiously urgent manner of the departed Dashan. Skeptical, he demanded, "Then why did your previous Owner seem so anxious to get rid of you?"

"It pleased it to accept my advice on the matter."

"You advised it to give you away?"

"A delicate, but complex point of Tradition was involved," began the Zlin, with all indications of plunging into a lengthy discussion of Dashan custom.

"Never mind," Ames cut in, alert to the warning signs.

"You need not explain it all now. I may accept your services on trial."

"A wise decision." The Zlin sounded gratified.

Sounded? Ames realized that there was a peculiar non-directional quality to the "voice." "I'm not hearing you physically, am I?" he asked.

"So long as this contact is maintained," confirmed the Zlin. "We may converse mentally. It is not necessary for you to speak aloud."

"Then you monitor my sensory input," Ames accused, alarmed.

"True. How else could I gather immediate data on which to base my advice?"

This gift, thought Ames, was turning out to possess disquieting features. Could it possibly have been constructed on Das? "Who made you?" he asked.

"That is not a matter to concern you."

"Confound it, I am concerned! Dashan technology isn't supposed to be capable of constructing a device like you."

"You think I am a Machine." The Zlin made it a statement, not a question.

Taken aback, Ames sputtered, "Well, aren't you?"

"No, I am a lifeform native to a distant region of Das."

Ames was aghast. "Lifeform—oh, no! We are forbidden to enter into communication with unknown alien lifeforms. I've got to give you back to your previous Owner."

Looping the chain back around his neck, Ames thrust the pendant inside his tunic and hauled on the reins, with lamentable results. Jolted out of its reverie, the surprised werbel broke into an unsteady trot.

"Stop!" shouted Ames. "Halt! Slow down!"

"Pull the left rein twice," advised the Zlin, "and apply pressure with the knees."

Ames complied. To his relief, the werbel fell back into its familiar plodding walk. Before he had quite caught his breath, Ames found himself confronted by a fork in the road. With care, he coaxed the werbel to stop while he rummaged in a cloak pocket for his plastamap. Each time he spread it open, a gust of wind would slap the wet surface back on itself. In the poor light, Ames traced his progress mainly by guess. He could detect no fork marked in the road from Takla to Landar.

"If your destination is Landar," observed the Zlin, "I would advise you to take the left fork. It passes a nearby Inn where you might rest until the weather improves. That route also provides a shorter transit to Landar."

"You convince me," said Ames, wrestling with the wet map, which he finally jammed into the saddle satchel. "Any place drier than this has to be an improvement. Besides, I can probably arrange from there to turn you over to the Guardians. There's no chance now to catch up with your former Owner."

"It is traditional for the Acceptor of a Zlin to retain possession of it until contrary advice prevails."

"Then I'm providing the contrary advice myself, thanks," Ames responded. "I'm a guest on Das. My sole objective here is to perform historical research, not get involved in a Dashan Gift Tradition that I know nothing about."

"So you are a Timesifter," said the Zlin, conveying a mental impression of pleasure.

Ames sneezed. "From what I've seen of Dashan Timesifters on this trip," he remarked crossly, "They're a help only if you want to trace land ownership, family genealogies, or trade concessions. They're not full-range historians at all, in the accepted sense of the word."

The Zlin gave the mental equivalent of a sigh. "In Ancient Days, each city had its Street of Timesifters. Lately, many traditional pursuits have lapsed into shameful neglect."

"If I could find just one Dashan who's a real historian," Ames mused aloud, "then I could complete my work and get back to Archive Center Ten."

"Some Timesifters of the Old Discipline remain," began the Zlin, when Ames's werbel lifted its head, bellowed, and started trotting again. "It senses the proximity of the Inn, no doubt," concluded the Zlin.

"I'm glad... I think," muttered Ames, as they jolted into a clearing that encompassed a small village.



THE INN LOOMED LARGEST among the clutter of rambling stone and brick structures. Like most old Dashan buildings, the Inn extended laterally into wings and enclosed courtyards added on through the centuries to the original nucleus.

Ames suspected that the interior was likely to resemble a three-dimensional maze. His speculation was quickly verified when an attendant emerged to direct him inside. Direction was required—Ames threaded his way up and down stairs, through a tangle of corridors that reminded him of another analogy with Jaris IV—the famed Starweb. Finally they emerged into a large Conversing Room.

As a new arrival, Ames attracted the polite gaze of the assembled company. There were only three Dashan guests, two of them absorbed in a game of *kirim*, while the third dried its cloak before the open fire pit. The Moderator/Innkeeper glided across the woven floor mats to welcome Ames, proffering the customary vessel of *jantra* on a polished

wooden tray. By now, Ames felt that his body fluids had to be at least one-third *jantra* by sheer dilution. Not even the most trifling meeting could take place indoors on Das without the serving of *jantra*. To Ames's taste, the muddy liquid had a faint, salty tang, and an aroma unfortunately reminiscent of soap. It was brewed from the dried bark of a certain cultivated shrub, and was prized by the Dashan as a refreshing stimulant. Ames found it aggravated his digestion, so he fortified himself each morning with a long-lasting neutralizing capsule.

Ames noticed that there were two goblets on the tray. A new dilemma—which should he choose? No doubt there was some traditional preference that he should observe, but he couldn't recall this situation from his training tapes.

"The Conversation of this House welcomes your Contribution," said the Moderator. "Will you choose the metal cup or the *saf*-horn?"

"Take the horn cup," prompted the Zlin.

Ames stiffened momentarily, then realized that only he could hear the Zlin's mental advice. "The horn will serve," he replied, bowing.

The Dashan drying its cloak turned to face him. Ames got the fleeting impression that had the Dashan possessed external ears, they would have pricked up.

"You will require a room with a window, then," the Moderator resumed.

Ames couldn't discern any logical sequence between his choosing a particular goblet and therefore wanting a room with a view, but the cardinal instruction on relations with Dashan was to be flexibly cooperative. "Thank you, yes," said Ames, "if one is available." He sipped at little of the *jantra* as courtesy allowed, and returned the goblet to the tray.

The wet-cloaked Dashan sidled closer. Lowering its head near Ames's ear, it murmured, "Moonrise comes late this night."

Ames felt as if he'd stumbled onto a stage in the middle of a performance for which he didn't know his lines. No one seemed to be making any sense. Maybe it was because he was tired, wet, and stiff.

"You might remark upon the inclement weather," suggested the Zlin, coming to his rescue.

"Unless the rain stops," Ames ventured, "no one will see the moon tonight."

The Dashan nodded at this profound observation, and swept back to its former position near the fire.

For the moment, the Moderator had vanished, so Ames walked toward the fire himself, hoping to drive away some of the chill of his long ride. He slipped off his sodden cloak, folding it over one arm. When he passed by the *kirim* players, one looked directly at him and said, "Will the frost-spice trade continue at the current level, do you think?"

Ames stopped short, striving to remember the latest trade projections on frost-spice as opposed to lantern tree spice. The Zlin's silent voice intruded. "It is customary for travelers to assume optimistic trade forecasts."

"As a Stranger from Afar," Ames squeaked, "my opinion is doubtless of slight value, but from the latest news I have seen, I would think this season's crop should be bountiful."

The Dashan blinked its nictitating membranes politely across its jade-green eyes, then resumed its contemplation of the *kirim* board.

Although confused by all the attention he was attracting, Ames also felt somewhat flattered. Maybe he was finally

being accepted. This was comparatively the most cordial reception that he'd yet received on Das. Perhaps out here in the countryside, the Dashan were friendlier. He was just beginning to detect a pleasant warmth through his damp tunic when the Moderator returned, beckoning to Ames.

"Allow me to conduct you to your room, Honored Traveler," it fluted.

Ames followed up more stairs, around several corners, and into a small but comfortably furnished room. With a final bob, the Moderator retreated with that gliding step that reminded Ames of a long-legged Terran wading bird.

Birds, moons, pendants—the weight of the whole weary, puzzling day settled on Ames. All he cared about at the moment was the quickest way to prepare for sleep.

But there was a bundle lying on his bed; that was worse, it didn't belong to Ames. His satchel was neatly propped at the foot of the bed.

"This isn't mine," Ames grumbled. "Surely there's some identifying mark on it." He turned the bundle around, examining the fabric from all angles. It was completely anonymous, and heavier than one would expect for a parcel of clothing.

"Bother—now I'll have to go looking for the Moderator. They must have thought this was mine."

"No," observed the Zlin calmly.

"No? What do you mean, 'No'? What do you think is in this bundle?"

"Stolen goods," said the Zlin promptly.

Ames sank onto the padded seat of the room's lone chair. "That's preposterous," he declared. "It's just a parcel of some traveler's gear that's gotten mixed up with mine. Why, there's nothing in it at all except—"

He loosened the closure straps and peeped inside. "Except..." His voice faltered as he shook out the contents on the bed cover—a profusion of tooled metal flashing with carved gem stones, arm loops, frontlets, and other strange shapes whose function he could only guess.

"Stolen goods," affirmed the Zlin cheerfully.

"This is dreadful! I must inform the Guardians at once."

"That would scarcely be in keeping with Tradition, since you indicated by your earlier conversation that you were a Receiver of such goods," the Zlin pointed out.

"I *what*? I just said what you suggested—completely innocuous statements."

"Dashan Thieves' Inns are bastions of Tradition," explained the Zlin with pride. "This is one of the most renowned. The ancient Thieves' Code is well known here."

Ames was horrified. "The Moderator—I could give the parcel to it." He began to sweep the glittering ornaments back into the bundle.

"That isn't necessary. The Moderator will receive its fee from the Thief. You have a language concept for the payment—a commission."

"The Moderator is a party to this crime?" Ames's disbelief flared into purpose. "I've got to return this parcel to its rightful owner, and that's that."

"But who is the owner?" asked the Zlin.

"You're the great adviser," snapped Ames, thoroughly flustered. He'd have plenty to say in his report about slipshod advance intelligence. Why hadn't they warned him about Thieves' Inns? Or Zlins, for that matter? "Well? You're supposed to advise, not ask questions."

"I merely point out that there are several possibilities to choose among. You spoke to three Dashan, including the

Moderator, when you arrived. Any one of them could have placed the parcel here, or had it placed here. You must institute inquiries."

Ames nodded, pausing in his repacking of the loot. "So I can tell the Guardians?"

"So you can make the traditional Offer," the Zlin corrected.

"Offer! That would make me an accessory to theft!"

"It is customary for the Receiver to appraise the goods and convey an Offer to the Thief, after which the Receiver gives the Thief a partial advance, should the full sum not be available."

Appalled, Ames stared at the bundle. "How do you know all this?"

"I have belonged to several Master Thieves, experiences which afforded ample opportunity to observe proper customary forms. I judge from your brief examination that these goods are worth a substantial amount."

Ames turned the last few items over in his hands. From his studies of Dashan artifacts, he knew that the delicate frontlets, also called brow bands, were at least four centuries old. Clear green gems trembled in suspended settings of silver wire. The mosaic inlay work on one arm loop was intricate beyond any example he'd ever seen. Carefully, he eased both back inside, bracing them gently with an oval hand mirror made of polished metal set in a shell case. There was just enough room left to slip in a pair of rings and a jeweled medallion rich enough to have adorned a royal bridle in the days of the Forest Kings.

"I've got to return these things," said Ames decisively. "I'm an historian, not a... a Receiver."

He marched back out to the Conversing Room, making only two false turns along the way. He paused on the top landing to survey the company. The Moderator wasn't in sight. Two more wet Dashan travelers were installed at a second *kirim* board near the fire, and to Ames's immense relief, he recognized the olive robes of two Guardians, who were drinking their welcoming cups of *jantra*.

Ames cleared his throat and requested the company's attention. Remembering the injunction to be flexibly cooperative at all costs, he decided to adopt the direct, simplest approach. After all, it was just the Zlin's opinion that the jewelry items were stolen. Maybe one of the guests was a jeweler or antiquary, and this bag held inventory items. Ames wanted to avoid trouble if he could.

"Please allow me to present this parcel for your Inspection," he began, holding it up for emphasis. "It was delivered to my room by mistake, and I wish to return it to its Owner at once."

The attentive silence stretched on. Surely one of the Dashan recognized its property. True, the light was a bit dim. Ames groped in the top of the parcel, and extracted the jeweled medallion. At that point, the legendary serenity of the Dashan evaporated.

There was a multiple rush toward the stairs, with several Dashan trilling angrily as they came. Ames could make out only snatches of the outcry. The Dashan who'd mentioned moonrise appeared to be the parcel's owner, for it was screeching about Outrages upon Tradition and the Discreet Silence always observed by proper Receivers. The two Guardians were attempting to catch the indignant thief, as well as to get to Ames, while the two latest arrivals were simply charging up the stairs with decidedly non-serene expressions.

The thief reached Ames first, and seized the parcel. Astonished by the toally uncharacteristic uproar, Ames hung on. The incongruous tug of war lasted for only a moment. With a loud ripping sound, the parcel's seams gave way, propelling the thief backwards into the path of the other four pursuers. In a confused tangle of arms, legs, and necks, the entire Dashan group cascaded down the stairs.

Ames lurched in the opposite direction, still unconsciously clutching a fragment of the bundle. As he staggered upright, rebounding from the stair railing, the Zlin's voice piped urgently in his mind, "Quickly—turn right, up those stairs!"

Ames took one look at the melee sorting itself out on the lower landing, and darted up the indicated stairs. "But this is a dreadful mistake," he huffed. "I'm . . ."

The Zlin cut in with more directions. "Through that second door, and take the curving corridor."

"I'm a respected archivist," Ames completed his objection.

"Out this window. The stable area is to your left."

"Surely I could explain to them . . . how I found the bundle in my room, and—"

"Hurry!" ordered the Zlin. "Take the crop-eared mount. It is already saddled. They are kept for the use of guests."

Ames was thundering out of the courtyard and down the muddy road before he realized that he was, in a sense, leaving the scene of a crime.

"Wait a minute," he shouted, then gasped as a low hanging branch slapped him in the face, spattering him with icy rain water. "Wait—I've got to go back and explain."

"I would not advise it," the Zlin counseled. "Strictly speaking, you have stolen this werbel, and its Owner—"

"But you said it was for any guest's use," Ames interrupted plaintively.

"True for several animals, but I fear that this is not one such. Its Owner may well object to our action."

"What can I do?" wailed Ames. "By fleeing, I'm declaring myself a fugitive. They may even think I had something to do with the theft of that jewelry!"

"That is unlikely, considering the irregular circumstances surrounding your departure."

"Irregular—I like that!" growled Ames. "You advised me, remember. Why did you tell me to give those coded responses that identified me as a Receiver?"

"You are a human," replied the Zlin, as if that completely answered the question.

"You are exasperating, not to mention a menace, a threat to the peace, a—"

"You are displeased?" For the first time, the Zlin's supreme confidence seemed shaken.

"Displeased' is one word that applies," Ames agreed grimly. "Horried" is another."

"But I thought that humans desired excitement." The Zlin sounded genuinely concerned.

"In bearable amounts," said Ames, his teeth beginning to chatter from the cold. "And when forewarned. Some humans . . . can get along . . . very well. I may add . . . without excitement, and I'm beginning to think . . . I am definitely one of them."

"I shall forewarn you, then, next time," said the Zlin, contrite.

"Thank you, I can do without a next time," asserted Ames.

"Considering the present for a moment, just where are we fleeing to?"

"This road leads to many places—Escavan, Bacara. It

should be simple to evade pursuit in either city."

"Why would anyone pursue me, other than the Guardians, that is?"

"The breaking of the Thieves' Code is viewed seriously here, and there is the matter of the stolen werbel's Owner."

"You mean if they catch me, I may regret it?" asked Ames.

"Severely. Death by Cintured Inversion has not been an uncommon penalty in the past, as well as—"

"I'd rather not hear about it," Ames interrupted. "Just now, what I need is insulation. This wind cuts like a cryoblast."

"I suggest that you investigate the contents of the saddle satchel," advised the Zlin. "Travelers often store spare cloaks there."

With fingers already numbing, Ames fumbled with the buckles, felt around inside, and pulled out a folded cloak. "Congratulations! That's one piece of your advice that I approve of . . . provided that there isn't something venomous nestled in the pockets. Pockets—" Ames suddenly realized that he'd stuffed something in his tunic pocket. He felt the lump cautiously. "Oh, *no*," he groaned. "I've brought along some of that blasted loot. When the bag tore open, I still held onto a corner of it, and—"

"Feel inside it," ordered the Zlin, highly agitated.

Ames couldn't imagine what point the Zlin had in mind, but he flexed his cold fingers a few times, and explored the torn fabric corner by touch. "There's a ring, and a squarish metal object, and something oval—that polished metal mirror, I expect."

The Zlin gave a wordless cry that nearly startled Ames out of the saddle.

"What's the matter with you?" the human demanded. "Want to get me killed?"

"The Handstone of Merlayn!" exulted the Zlin, then added in a more subdued tone, "either that or the Dark Scourge—it must be one or the other. What splendid fortune that you should have recovered it!"

"Good fortune," snorted Ames, who was still shivering. "What are you talking about?"

"Surely you, as a Timesifter—" began the Zlin.

"Historian," corrected Ames.

"As you please—an Historian, you must be aware of the famed Lost City, Danya the Magnificent?"

"Certainly," said Ames, wrapping the cloak around himself as best he could while dodging branches and keeping his balance in the saddle. "A sudden flood, or according to alternate interpretations, an earthquake, killed most of the inhabitants. The few survivors were scattered, and with the altered terrain, the location of the ruins was lost. What does that have to do with me? It's a legend of the far Dashan past, and there may never have been such a city, according to Brion."

"Danya was," stated the Zlin. "We Zlin know and remember. Not the location." It added, forestalling Ames's excited query. "So much time has passed. Where forests once grew, now desert sands drift; mountains sleep beneath great waters."

Ames took a firm grip on his imagination. What historian had never daydreamed of discovering the Lost City of Danya? "What has all that to do with me?" he prodded.

"The Sage Merlayn lived for a time in Danya," the Zlin continued. "After the Sage's disappearance, a figure of Merlayn was displayed in the Court of the Timesifters. It was said that Merlayn had sealed its wisdom within the figure, so

that those with questions had but to place their hand upon the figure's hand, and their questions would be answered."

Ames had never heard this variation on the legend of Merlayn. Intrigued, he asked, "How did it work? Could any question be answered?"

"An interesting point," commented the Zlin, "and one which must have frustrated many seekers. It is said that no question would be answered if the seeker desired selfish personal gain, or evil advantage over others."

"That must have limited the number of seekers," said Ames. "I suppose the figure wasn't infallible, or else it would have warned of the final cataclysm."

"Regretfully, the legend is only fragmentary. The figure vanished after the disaster, but the hand, which contained the stone plaque to be touched by seekers, was rumored to have survived."

"The Handstone of Merlayn that you mentioned before," Ames deduced. "What was that other thing—the Dark Scourge?"

"Both were ancient Objects of Power," the Zlin explained. "The Dark Scourge is seldom spoken of, although it is as old as the Handstone, if not older. For many years, it has been assumed that the Dark Scourge was destroyed in the last of the Wars between the People of the Staffs."

Ames no longer felt the chill or flinched at the werbel's jarring gait. This was what he had come for—to fill in the vast gaps in Dashan history as known to the Outside. Because the early Dashan favored oral histories transmitted through something similar to a bardic tradition, no known written accounts existed from the chaotic period during the Wars of the Staffs. Historians relied on fragmentary legends and ballads from those years, many of them preserved in dialects imperfectly understood even by the Dashan.

The modern Dashan of this region descended from the People of the Green Staff, a tall racial stock which had abandoned the cold, mountainous areas of the planet to their opponents in the inconclusive wars, the People of the Black Staff. Descendants of that stock still inhabited the mountains. They were much shorter and stockier than the Dashan of the Flat Regions. Ames had seen tri-IDs of the modern Dashan of the Cold Reaches. Using a conventional Terran analogy, it was often said that while the tall Dashan resembled long-necked wading birds, their shorter, distant cousins looked very much like Terran penguins in general shape.

Both groups had round, owl-like eyes, the circular pupils set in irises varying through several clear shades of green, with no opaque white area visible. Their resemblance to Terran birds was further enhanced by the rigid nose, which formed a bony dihedral projection overhanging the small slit mouth. The dark green, velvety down capping the ovoid head suggested yet another avian analogy.

The Zlin continued, its voice dropping into the chant of the Dashan mnemonic Recitative Style. "It is said that the Dark Scourge came from the Bleak Mountains, but it is also said that no person knew with certainty whence it came. Those were the Years of Blood, the Dark Years. Green Staff warred against Black Staff. Evil creatures laired in the Bleak Mountains. In time, scattered tribes of the Black Staff came together to seek the aid of Those Whose Name is Accursed. They made a cruel alliance, and for those Dark Years, the People of the Green Staff reeled back, suffering defeat after defeat. For a time, the Dark Scourge brought victory to the Black Staff, but then arose the Sage Merlayn, who led the People of the Green Staff to the Triumph of Luzar. The power

of the Black Staff was broken, but the mountains remained the refuge for the shattered enemy."

"What power did this Dark Scourge possess?" asked Ames. "What was it like, physically speaking? A piece of stone, like the Handstone, do you suppose?"

"There arises the difficulty," admitted the Zlin. "All references to the Dark Scourge were ordered expunged by Merlayn, stricken from the Dashan memory. No ballad, no verse was to speak of it. We Zlin alone preserved one passage from a battle song. It suggests that the Dark Scourge drove its victims insane, with no hope of recovery."

Ames was impressed. For the Dashan, justifiably proud of their devious intelligence, insanity held a particular horror. The prospect of a weapon that could render whole groups insane must have been utterly demoralizing to the ancient Dashan.

"Why do you think I may have discovered the Handstone—or the Dark Scourge, as the case may be?"

"We Zlin are sensitive to many influences. We are aware of the nearness of an Object of Power. You have acquired one."

"But which one?" persisted Ames. "Isn't there some way we could visually identify the Handstone?"

"The only person who could distinguish the truth would be a Timesifter of the Old Discipline," said the Zlin.

"And where can we find such a rarity?" asked Ames in a deceptively calm voice.

"It is said that Kelaren of Bacara—" began the Zlin.

A nagging suspicion that had been edging into Ames's mind suddenly flared into conviction. "Aha!" he exclaimed. "This road goes to Bacara, didn't you say earlier? You planned this, this whole horrid escapade. You deliberately—"

"Yes," admitted the Zlin with disarming frankness. "When you first touched the mirror case at the Inn, I knew that an Object of Power was concealed within it. At that point, it was clear that you must travel to Bacara to seek Kelaren the Timesifter."

"I'm glad some of this muddle is clear to one of us," Ames grumbled, but in spite of his normal tendency toward caution and careful forethought, he couldn't help being excited by the sudden drastic change in his tidy, scholarly, uneventful life. "How far is it to Bacara?"

"Dawn should overtake us there," replied the Zlin, and it was right.

BACARA WAS ONE of the most ancient of Dashan cities. Being so old, it had come to be revered for Tradition's sake, and still housed nearly as many Dashan as in its ancient prime when it was the focus for four great trade routes. Parts of the city, however, were less frequented than others. It was into these winding, deserted lanes that the Zlin's silent voice steered a weary Ames and his increasingly unwilling werbel.

"I'm sorry," Ames said at last, yawning. "I don't care who's on my trail, I've got to stop and sleep."

"Get down and walk, then," advised the Zlin. "It is a matter of only a few more steps to the Court of the Timesifters."

Ames climbed down stiffly from the saddle, stretched, and took the reins to lead the werbel forward, but the wily creature had lowered its head as soon as it stopped, and was now snoring blissfully. No amount of heaving and coaxing by Ames was sufficient to waken the beast.

"Leave it here," urged the Zlin. "The bridle medallions

identify it. It will be returned to its Owner when the regular Guardian patrol discovers it wandering free."

"Very well," said Ames, grateful to be standing on a surface that didn't lurch beneath him. "I'll replace the cloak—then there'll be no real loss to the Owner." He secured the satchel straps and stepped back. "Which way now?"

He had almost gotten into the habit of speaking mentally to the Zlin instead of talking aloud. As an Outsider, Ames felt conspicuous enough on Das—he didn't want to call more attention to himself by talking loudly to an apparently invisible companion. He pulled up his tunic hood to conceal his black hair. Few Dashan were out in the streets at this early hour. If anyone saw Ames, they might mistake him for a short, although unusually thin Dashan of the Cold Reaches.

"Through that peaked arch," directed the Zlin. "Then past the colomade."

"You've been here before?" asked Ames, making conversation in a deliberate effort to stay awake. "Do you know this Kelaren by sight, so to speak?"

"Many years have passed since I last entered the presence of the Timesifters of Bacara. Kelaren was a student then, learning the Art from a Master Sage in the Far Desert Region. It is said of late that Kelaren is the greatest living Timesifter in all Das."

"I hope it keeps some extra food on hand," muttered Ames. "Not to mention a spare bed."

"Behold," invited the Zlin, as Ames rounded a corner. "Only a shadow of its former grandeur remains—the Court of the Timesifters."

Ames shook himself, and took a deep breath of the cool morning air. As he gazed around the closed courtyard, he forgot his fatigue. It was like stepping back in time. The architectural style of the buildings opening on the court was cleaner, sparer than the "modern" Dashan style. As the sky brightened through low, scurrying clouds, Ames could discern the signs of age—the meandering cracks in the stone, the worn tiles, the spiral fountains dry for who knew how many centuries. Still, the effect of retreating into an earlier age persisted. He would have liked to stand there, watching the dewbirds sip droplets of condensed moisture from the shaded walks, but the Zlin wouldn't allow him to linger.

"To the left," it directed briskly. "The House of Kelaren occupies the whole of that end of the Court."

Ames managed to convert his trudging pace into a slightly more alert stride. He was tired, he ached in more muscles than he thought he possessed, and he wanted nothing so much as a cup of hot, honest Terran tea, but he suppressed these awarenesses, and entered the open-arched anteroom to the House of Kelaren.

It was not an impressive room. The single wall hanging was threadbare, its pattern bleached by age into complete obscurity. A plain stone bench faced an equally plain dapple-wood chest across a floor of deep red tile worn by the passage of countless feet.

"How do we go about summoning Kelaren?" Ames was mentally inquiring, when the massive, metal-bound door set in the inner wall swung open with a faint sigh. To Ames's surprise, the person at the door was a short Dashan dressed in a faded blue robe. Its eyes were a dull green, like murky canal water. For a Dashan, its voice was unusually deep, but then its neck was considerably shorter and wider than average.

"Greeting to the Traveler Who honors the House of

Kelaren," it droned. "This person is Etrik, a Student at the feet of the Sage."

Ames bowed in return, repeating aloud the courteous phrases helpfully supplied by the Zlin. "Greeting to the House of the Illustrious Kelaren. This person is Ames, a Seeker after Ancient Truths. The wisdom of the Sage has been commended from afar. May the Seeker approach?"

Etrik bowed, sweeping one arm to its side in a Gesture of Invited Entry. Ames stepped through the doorway, and Etrik shut the door, sliding a heavy locking bar across thick side supports. Security minded, thought Ames, following his guide through the customary Dashan maze of corridors and passageways. Nobody ever simply walked in upon an important Dashan—one had to chart one's way through an obstacle course in order to find one's host.

Etrik paused at last before a dapple-wood door seemingly no different from at least six others they had passed by. It rapped twice on the upper panel, then opened the door, preceding Ames into a square room whose walls were muffled by floor to ceiling hangings of dark blue *thessl* fabric. Etrik closed the door behind them, squatting afterward on a woven mat in front of the door.

"It is not traditional for a Student to attend a Seeking without the express joint permission of the Seeker and the Sage," observed the Zlin.

Ames nodded, hastily converting the nod into a formal bow toward the figure seated in the center of the room on a high-backed, throne-like chair. The human glanced around hopefully for the customary Guest's Tray of *jantra* and morning cakes, but the room was bare of such expectable amenities. For once, Ames had actually been looking forward to drinking *jantra*—to anything edible, in fact. Resigned to staying hungry for a while longer, Ames put his mind on the proper forms of address to the tall, elderly Dashan in the chair. Somehow the Sage didn't look as elderly as Ames had expected. He launched into his preamble. "May a Traveler from Far Places, a Fellow Seeker after Ancient Truths, advance to greet the Illustrious Kelaren, Sage among all Timesifters of Bacara?"

"Advance, Honored Seeker," trilled the green-robed Dashan, flourishing its traditional Token of Position, a thick, honey-colored wand carved from the inner wood of the shawl tree.

The quiet dimness of the room was soothing, inviting relaxation.

"Beware!" snapped the Zlin, jarring Ames back to alertness. "All is not proper here. The robe of the Sage does not fit the Sage. Ask if matters from the Ancient Times may be discussed."

Kelaren nodded graciously after Ames had posed the request. "It shall be both Honor and Pleasure to plunge into the waters of Time Past with a Fellow Seeker. Which Age attracts your inquiries?"

On guard thanks to the Zlin's warning, Ames resisted the urge to pull out the mirror case and ask for Kelaren's immediate opinion. "Some artifacts have been brought to my attention," he began instead, dropping into the less formal mode of Dashan.

"If you possess items of questionable authenticity," inserted Kelaren, "it would be my pleasure to examine them."

"Describe the mirror case," suggested the Zlin, "but do not admit that it is concealed on your person."

"I was seeking shelter at an inn on my way to Landar."

Ames resumed, noting how the Dashan stiffened slightly at the mention of the word "inn." "While there, I chanced to observe a collection of fine old jewelry carried by another guest." There was no doubt of it now—both Dashan were rigidly attentive. Could news of that ridiculous escape have preceded Ames to Bacara? No, he answered himself, not without a comlink, it couldn't. As he described several of the older pieces he remembered from among the loot, Ames wondered if he had marched into another den of thieves.

Kelaren shifted its wand of rank from one hand to the other.

"It may be a Thief," declared the Zlin, "but this person is not the true Timesifter. It is an imposter. We must leave this place at once."

Ames wanted to ask how the Zlin proposed to leave without a map of the corridor-maze, but had to jerk his mind back to the conversation with the provisionally false Kelaren.

"The chief item that attracted my interest," said Ames, in as bland a tone as he could manage, "was a polished metal mirror set in a most striking case of shell."

That was it—Ames could sense an almost feline purr as of a tawny *chakar* tensed to pounce on an unsuspecting groundhopper, as the Timesifter leaned forward to ask, "The design of such mirrors has been an especial study of mine. Perhaps you have borrowed this exceptional specimen so that I may express my opinion of it?"

"Unfortunately, no," parried Ames. "The Owner was most reluctant to part with it."

"But you are aware of its location—we might journey there together to view this case?"

"An excellent idea, after I have rested," said Ames firmly. "In my haste to consult with you, I have ridden all night."

Kelaren stood up, a bit too smoothly for its presumed age. "Forgive the eagerness of the secluded Scholar," it apologized. "You must rest after your journey. Etrik will guide you to a quiet room. Later, we may continue our discussion. The mirror case will still be accessible then, will it not?"

"Of course," murmured Ames, moving aside as the Sage swept toward the door.

Ames twitched reflexively when the Zlin suddenly exclaimed, "Now! Behind the chair—the hanging moves in an air current—there must be an opening. Run!"

Time and Zlins, thought Ames as he dodged the carved chair, wait for no man. Not pausing to see what reaction his Dashan hosts were giving to this unorthodox behavior, Ames seized the hem of the wall hanging and ducked under it. For an instant, he groped frantically against solid wall.

"Where's that door, Zlin?" he muttered, then his right hand slipped into open space. It was even dimmer in the dusty, winding corridor beyond, but Ames ran as if it were midday on the Petrosian Grand Concourse. Muffled sounds of pursuit spurred him on, together with the Zlin's terse comments.

"Take a side turning when you can, but try not to leave signs of so doing. Here, to the left! Down these stairs—left again. Feel the walls for panels."

"Panels?" Ames panted aloud.

"Quiet!" roared the Zlin. "Speak only in the mind! Panels—what is your phrase?—secret panels. It is likely that there are such in this House."

"All I need," thought Ames. "Such practical advice—Run for your life, old man, but by all means, pause now and then to feel for secret panels."

Despite misgivings, he veered erratically from one wall to another, pressing wall ornaments, moldings, light strip bases. Inevitably, he slowed down while doing this, and the thump of pursuing footsteps became steadily more distinct.

"Faster," urged the Zlin.

"I'm going as fast as—" Gulping the musty air, Ames caught a boot toe on an uneven tile, and slammed his shoulder against a brace for a ribbed arch. Half stunned, he staggered across the passage to lean against an ornamental column.



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"Move!" ordered the Zlin. "Run!"

"Wait," gasped Ames, rubbing his shoulder. "This carved border seemed to shift."

The column abruptly pivoted, sweeping Ames along with it into complete darkness. Stumbling from the imparted momentum, Ames sprawled on a cold stone floor gritty with a film of dust. The panel spun full circle, cutting off the faint light from the corridor. It seemed only seconds before Ames heard footsteps pound past in the outer corridor. The dull echoes died away, leaving him in silent isolation.

"Wouldn't they know about secret panels in this house?" Ames whispered, cautiously pulling himself to a sitting position.

"Some Traditions are remembered by only a few," replied the Zlin, its usual calm restored.

Ames blinked, trying to accustom his eyes to the darkness. "Should I dare to show a light?" he ventured mentally.

"Determine first if this is an enclosed area," advised the Zlin.

Ames dutifully groped his way to the nearest wall. Feeling in his belt wallet for something to mark his starting point,

Ames settled on a damp glove. He laid it on the floor at a right angle to the wall, and embarked on a slow circuit of the area. Only a short time elapsed before his foot brushed across the marking glove. The room was quite small, about eight paces by six.

"Like a cell," thought Ames, and shivered.

"Where, then, is the cell door?" asked the Zlin.

"You're right. There isn't any door—not that I could feel, anyway. The only way out appears to be through that rotating panel, but its reverse outline is not immediately obvious to



the touch."

"Further exploration would be aided by illumination," the Zlin concluded. "Under such circumstances, calculated risks can be justified."

Ames extracted a simple chemical flame jet from his belt wallet, and pressed the activator. For an instant, the distorted shadow looming on the far wall disconcerted him until he realized that it was his own. Except for a single block of stone near the middle of the floor, the stone-faced room was absolutely bare.

Ames set his makeshift lamp on the block and began an intensive examination of the walls and floor. After his second circuit, he sat on the floor beside the block. "A dash of precognition would be helpful about now," he remarked, still speaking mentally as a precaution against eavesdropping. "Do you have any useful advice?"

There was a pause, then the Zlin observed, "I perceive two possibilities dependent upon the duration of this captivity. Either you die here from lack of food, air, or water, if we cannot discover an exit, or our pursuers may find us, to our detriment."

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"Thanks. You cheer me enormously."

"There is a third alternative—a rescue by unknown allies, but that would not appear to be coherent...or would consistent be a better term?"

"I'm not feeling too coherent myself just now," declared Ames. "I'll settle for getting out of here alive. While I collect my wits, do you think there'd be any harm in looking at the presumed cause of all this chasing about?"

"You doubtless refer to the Object of Power concealed in the mirror case," said the Zlin. "It is not mentioned in the Lore that passive observation of the Handstone affected the onlooker. Even less is said of the Dark Scourge. I would advise you most strenuously not to touch the Object."

Ames burrowed in the inner recesses of his tunic. "Don't worry. I have no desire to be struck mad or incur some awful blight. This is a handsome case, by the way. The problem is to open it."

He twisted the case gently, without results, then pried with his thumbnail at a faint seam. "The makers didn't intend for this to be opened easily," he remarked, reverting to the twisting method again. The top section slid fractionally, then stuck. Ames persisted until the case split into halves, the deeper half containing a thin packet wrapped in the sheepest *thessl* fabric Ames had ever seen. Warily, he tipped the packet out onto the stone block. Using a stylus from his wallet, he prodded aside the fabric covering. The smooth oval surface he exposed shone in the flame jet's light with a soft, multicolored luster.

"Why, it's beautiful," said Ames, surprised. "Some kind of opalescent stone—a milky, semi-opaque matrix. Surely this couldn't be the Dark Scourge."

"The descriptive word 'dark' may well not refer to the physical appearance of the Object," cautioned the Zlin. "We cannot be certain which Object this is until the authentic Kelaren examines it."

Ames crouched on his heels beside the block. "You don't suppose that those two Dashan we saw have killed the real Kelaren? Here in Kelaren's own city, they couldn't expect their imposture to succeed for long."

"We have scant material from which to draw deductions. Still, for whatever reason, they wished to delude *you* into accepting one of them as Kelaren, and further, to trick you into revealing where you had hidden the mirror case. We must assume that they suspect the presence of an Object of Power associated with the case."

Ames folded the fabric back around the gleaming oval, and replaced it in the mirror case. "Thieves!" he suddenly blurted. "Zlin—that's possible. It could have happened that way. At the Thieves' Inn, I found the case among other stolen goods, so the mirror case was probably stolen, too. If someone deliberately had the case stolen, then they wouldn't be pleased when I rushed off with the case. And they'd rather trick me out of it before I found out what was inside the case... but how could their agents at the Inn communicate with the two here? And what have they done with the real Kelaren?"

"Speculation," pronounced the Zlin, "while stimulating, would not appear to aid in our most pressing objective—departure from this confinement."

Ames sighed, but nodded in agreement. "There has to be a switch somewhere, a catch, a movable block to operate that panel from this side."

Taking the flame just in one hand, he felt the wall blocks again, then repeated his scrutiny of the floor. "This is

frustrating," he declared at last. "The only part of this room that I haven't crawled over is the ceiling... the ceiling!"

Excited, Ames peered upward at the ceiling, which was low by Dashan standards. Staring over his head as he walked, he bumped into the stone block. "Aha! Why would the builders leave a block in the middle of the floor if not to climb on?" he demanded. "I might be able to touch the ceiling if I stood on the block. Provided," he added, as he balanced the flame jet. "I don't catch my sleeve on fire. Now then... I *can* touch the ceiling, for whatever good that does."

He pressed the ceiling area within his reach. Nothing encouraging happened. "Bother," said Ames crossly. "Where is the blasted exit?"

"Perhaps it is necessary to move the block," countered the Zlin. "It might not have been left directly beneath an exit panel."

"You're right," Ames conceded. He stepped down, knelt and put his right shoulder against the block, and winced and changed to his left shoulder. "Forgot about that buttress I ran into. It's a pity, by the way," he went on, as he maneuvered for leverage, "that you can't help on the physical side of things."

That thought had occurred to him earlier, during the chase through the corridors. After carrying on an extended mental dialogue with the Zlin, it became deceptively tempting to think of the Zlin as a physical ally who just happened to be out of sight at the moment. Ames couldn't afford to entertain that delusion; when it came down to a matter of muscle, Ames had to rely on his own.

He braced a leg against the nearest wall and heaved. The block gludgingly slid a few centimeters. Ames stopped to breathe, calculating just where he should move the block for maximum access to that part of the ceiling that he hadn't tested. By the time it was placed to his satisfaction, Ames had acquired several assorted scrapes and bruises, but he ignored such minor annoyances, devoting his whole attention to the newly accessible ceiling area.

His fourth probing lunge was rewarded when half of one ceiling panel grated upward. Exultant, Ames almost slipped off his perch on the stone block. Edging the panel up and to one side, he disclosed a square opening large enough for his shoulders to pass through. "Where shoulders can go," whooped Ames, "I can go!"

"These vocal outbursts of yours may be ill advised," admonished the Zlin.

"Sorry," Ames replied. "Not too much has gone well for me lately. Now to get through that hole."

Blessing the tedious hours he'd spent in exercise on the long passage to Das, Ames flexed his arms and glanced around to be sure he was carrying everything he could use. He thrust the flame jet up into the cavity, but couldn't see much detail by its light—just more rough-surfaced stone. Setting the jet on the inside lip of the opening, Ames pushed it carefully away to one side. The light flickered, then held steady. Ames crouched and sprang, gripping the side edges of the opening and raising his upper torso through the gap. He feared for an instant that he didn't have enough strength to hold on, but he wriggled forward, pivoting on his elbows, until he could wedge a knee up. With a final effort, he was safe. He sat up hastily, and grazed his head on the tunnel's roof.

"I just thought I was in a tight spot before," said Ames ruefully. "Who intended to use this tunnel—dwarves?"

"The word 'dwarves' is not familiar to me," responded the Zlin. "If there were any provisions for seeing through the

ceiling panel, I should deduce that this tunnel was built to allow clandestine observation of the occupant in the room below. The lack of such a view-port invalidates that conjecture however."

Taken aback, Ames asked, "Why would a Timesifter, of all people, need a dungeon in its cellar?"

"Contrary to present appearance, Das has not always enjoyed tranquility," the Zlin replied. "I advise you to replace the panel in case our pursuers should discover the vacant room behind the revolving wall section."

"Good thought," Ames fitted the panel back in the tunnel "floor," then pulled out his glove again as he prepared to move. "Might as well mark this square for future reference, if we ever have to retreat this way. I should have brought along something more useful for marking secret panels—maybe my stylus will leave a mark on this surface, and I can save my gloves for crawling protection." The stylus did produce a satisfactory smear on the stone, and Ames was soon ready to explore the tunnel.

With scant head room even for sitting, the tunnel's cramped dimensions forced Ames to crawl on hands and knees, pushing the flame jet ahead of him.

"Considering the trap door we just left," he thought to the Zlin, "prospects may be good for us to find other such openings into other cells."

"A reasonable hypothesis," agreed the Zlin. "Is it not curious," it continued, as Ames crawled past a juncture with another tunnel, "that this arrangement of cells and tunnels appears designed more for the advantage of the presumed prisoner than for the captor?"

Ames paused to massage a nagging cramp in his thigh. "You mean this all makes more sense as an escape route than as a place to imprison enemies. That's a plausible point—so far, we've eluded pursuit by hiding in this maze. On the other hand, if we starve in here because we can't find a way out, we won't be any better off than if we stayed in the original cell."

"To be precise," the Zlin corrected, "you may starve. I am in my physically dormant state, and therefore require neither food nor water, and very little air."

"Convenient for you," Ames retorted. "Which way should I take here?"

The tunnel ahead branched into three openings, with no indication of ascending or descending slopes.

"Your sense of direction is unfortunately not well developed," observed the Zlin. "I believe that the passage to the right may lead toward the frontal area of the House."

Ames angled to the right, only to stop abruptly. "Ouch! I just discovered an irregular block... with my knee. Somehow, I don't think I was designed to be a crawler."

"Could the uneven edge indicate—" the Zlin began.

"I know—another trap door," Ames completed the thought. "I don't have anything to pry with. Maybe if I tapped on the slab, the person below, if there is one, could lift while I pulled."

"It is a risk," warned the Zlin. "Such noise might attract unwelcome attention."

"Crawling is a risk—my knees may wear out soon. I'm going to try it." Ames found a coin in his wallet, and tapped it against the uneven slab. After hours of relative silence, the metallic impact sounded unnaturally loud. Ames waited a few seconds, then tapped again. This time, there was a faint response from below, a hollow knocking as of wood on stone. Then the slab began to tilt slightly.

Ames, quite surprised that his speculation was being acted

upon, grabbed the lip of the slab to help dislodge it. In a moment, the slab came free. Ames found himself staring down at the upturned face of a Dashan stranger. The Dashan's expression was serene, as if it frequently greeted drop-ins through its ceiling.

"Greeting, Outsider," it said amiably. "I am Kelaren of the Broken Staff. I have been waiting for your arrival."

Ames hesitated. He'd already met one Kelaren in this madhouse. How could he be sure that this was the real one?

"Ask it questions, of course," came the Zlin's silent advice.

Ames asked the first thing that popped into his mind—one of the questions he'd come to research on Das. "When did the First Conjunction meet and where?"

"Twelve hundred years ago, by our Dashan measure," Kelaren replied calmly. "In the Old Quarter of the city now known as Escavan. It was a year to the day after the Great Venture had been undertaken. Will you not come down? My neck is no longer as supple as it once was, therefore I find this posture tiring."

Ames started to scramble through the hole, then crouched back. "Forgive the impolite omission of traditional courtesies," he said, "but can we leave this room other than through this tunnel?"

Kelaren surveyed him with apparent approval. "Practical forethought—an admirable trait. Yes, there is a door to this room, but my captors have prudently secured it from the outside, so it is useless to us. They were not aware, however, of the ceiling panel, although I knew of it. As you see, that knowledge could not assist me in escaping." Kelaren casually raised the loose sleeve on its right arm, exposing a twisted, shrunken limb, the ivory skin seamed with scar tissue. "We Dashan are almost always ambidextrous, as you may know. I seldom find my condition hampering, but in this case, it definitely prevented my climbing out unassisted."

"It is Kelaren," confirmed the Zlin unexpectedly. "A Traveler once told my Owner of this injury to Kelaren. That is why I was certain of the earlier imposture."

"If there's something movable you can stand on," Ames suggested, "perhaps I can help you climb up here." A sudden thought struck him while Kelaren was placing the room's only furniture, a crude wooden chair, beneath the opening. "Can we be overheard, do you think?" he whispered. "I should have asked sooner."

Kelaren steadied itself with its left hand as it climbed onto the chair seat. "I would assume that risk is small," it replied in normal conversational tones. "They would not likely expect that I would speak aloud to myself, or if so, not about the matter on which they desire my knowledge."

Standing on the chair, Kelaren nearly touched the ceiling with its head, so Ames could get a good grip on the Dashan by lying prone in the tunnel. Although taller than humans, Flat Region Dashan were also generally lighter in weight, due to a lighter bone structure. Even with these positive advantages in his favor, and Kelaren's best efforts to help, Ames was breathing hard by the time he succeeded in drawing the Dashan up beside him.

"Do you know your way around these passages?" Ames asked as they rested for a moment from their exertion.

"Only partly. When younger, I explored many of these sublevels, but that was long ago. It is fortunate that you have a device to provide light. Shall we proceed elsewhere? My captors often come to question me at odd times."

"By all means." Ames replaced the slab, then squeezed by

Kelaren to lead the way. "I was in a secret room a short distance in this direction," he said in low tones over his shoulder. "The two Dashan chasing me ran right past the entrance to it, so I suppose it's as safe a place to talk as any. Maybe even better," he added, "if you know how to open the revolving entry panel from the inside."

"If the panel consists of a pivoting ornamental column," said Kelaren, "I may be able to locate the opening mechanism."

"Good," declared Ames. "I've had enough climbing and crawling to satisfy me for years to come."

Once at the marked slab, Ames helped Kelaren slide through the opening onto the stone block, handed down the flame jet, then lowered himself until his toes brushed the block. It was a distinct relief for him to stand upright without colliding with the ceiling.

Free for the first time to notice details of Kelaren's appearance, Ames was struck by the Dashan's eyes. They were a clear gray-green, an unusual color for a Dashan. Kelaren's downy "hair" was silver-green, like frosted moss, an indication of considerable age. The opaque nictitating membranes that served the Dashan as eyelids drooped partly down over Kelaren's eyes, lending it a deceptively somnolent expression. Meeting Kelaren's penetrating gaze, Ames knew there was nothing drowsy about the mind behind those eyes.

"Were you brought as a prisoner to my House?" inquired the Dashan.

"No," said Ames. "I am an historian. My name is Ames. I came to Das from Archive Center Ten to research early Dashan dating sequences. By chance, I acquired an ancient artifact which I was advised could be of considerable importance. It is concealed in this mirror case." He extracted the case and handed it to Kelaren, whose eyes widened the instant the exchange was made. Had the Dashan possessed eyebrows, they would have arched in surprise.

"An Object of Power lies within," Kelaren stated with certainty. "Could you withdraw it for me? It is difficult to perform a twisting motion with one hand."

Ames quickly spun the case open. Kelaren looped a fold of its robe over its left hand so that bare flesh would not touch the stone's surface.

Prodding aside the sheer *thessl* wrapping, Ames asked, "Can you identify this Object?"

Kelaren blinked its membranes closed for a moment, then smiled as near a smile as a rigid-faced Dashan could achieve. "Honored Ames," it announced, "you have recovered the Handstone of Merlayn. You are also," it added, "in possession of a Zlin."

Startled, Ames clasped a protective hand over his hidden pendant. "How could you know that?"

"The Handstone of Merlayn reveals many things to those who know how to ask," replied Kelaren. "So long as the Handstone is physically this near, I may join in discussion with you both."

Ames realized that the last words were spoken mentally. "The Handstone promotes mental telepathy, then," he thought back.

"Of a limited nature," Kelaren confirmed vocally. "I have not met your Zlin before, I believe."

"That has not been my privilege," thought the Zlin, in unusually respectful mental tones.

Kelaren nodded formally. "I congratulate you, Honored Ames. Linkage with a Zlin is a rarity in these times."

"It can also be confusing, not to mention dangerous," said

Ames, preoccupied with questions concerning the mysterious Object. "Are you sure this is the Handstone?"

"Quite certain. We Timesifters were entrusted with the Handstone long ago because we have never sought power over others. When the Handstone was lost, we knew it would reappear, inevitably returning to us, the only Dashan with knowledge of its uses."

"So that's why they had agents here—to question you about the Handstone," reasoned Ames. "But who are they? I met only two of them above—the tall one who posed as you, and the short one claiming to be Etrik, your Student."

"To a Timesifter, the passage of mere hours can seem a trifling span," said Kelaren. "Here in the sublevels, one's judgment of time can be easily distorted. Thus, I cannot determine precisely how long I have been held prisoner, but I estimate a period of two days."

Ames frowned. "That would mean they seized you before I ever acquired the mirror case."

"We appear to be dealing with a number of determined people," observed Kelaren. "Relate, if you will, your experiences. Perhaps we may then be able to form a more comprehensive view of otherwise confusing events."

With occasional comments from the Zlin, Ames told of his brief visit at the Thieves' Inn, and concluded with his fortuitous entry into this hidden room.

Kelaren nodded his head at the end of the recital. "Some points are indeed clarified. Two days ago, the two Dashan you described entered my House to consult with me, they said, upon a certain collection of old jewelry. It was to be brought here by their agents—apparently the other two Travelers who pursued you at the Inn. Since you, in turn, acquired the parcel of goods by being mistaken for a Receiver of such things, we may surmise that the single Thief who struggled with you on the stairs possibly had taken the parcel from the two Travelers, who backtracked their loss to the Inn."

"That makes sense," Ames agreed, and laughed. "If I got confused because of all the stealing and mislaying involved, I can picture how unsettled Etrik and your impostor must have been when I intercepted their goods by mistake."

"We can only speculate," Kelaren cautioned. "Our reconstruction, while plausible, may rest on fallacious assumptions. The two who approached me claimed that the goods they wished evaluated were part of a legacy. When I sought details, they evaded my questions. They attempted to converse with me about ancient Objects of Power. Such matters are not lightly discussed. Resenting my reticence, they confined me in the sublevels to await the arrival of their goods—an arrival delayed and ultimately foiled by you."

"What can we do now?" asked Ames, conscious that a thorough search of the House must be proceeding, even as they talked.

"Your possession of the Handstone alters the situation considerably," Kelaren mused. "Boldness may be advisable—a maneuver not unlike that of Kurtees the Elder in the Fourth Recourse."

"Possibly an analogy might be drawn to the Crossover Advance tactic employed in opposition," suggested the Zlin deferentially.

"Excuse me," Ames interposed, "but what are you talking about?"

"A most famous ancient game of *kirim*," explained the Zlin. "When faced with a twofold lateral threat to the subordinate baseline Kurtees—"

"Say no more," pleaded Ames. "I gladly accept your

judgment when it comes to *kirim*."

"I have previously observed that Outsiders find our game difficult to grasp," said Kelaren politely. "Perhaps at some later time we may discuss the matter. At this time, however, let us depart for more comfortable surroundings."

The Dashan rose from the block where it had been sitting, and tucked the *thessl*-wrapped Handstone in its belt pouch. As it ran its slender fingers along the left side wall near the ceiling, at a height accessible only for a tall Dashan, Ames saw why he had missed finding the exit mechanism.

"Many years ago, I explored a room like this one," commented Kelaren, walking slowly beside the wall. "I found the proper stone then by chance. Ah—this should be the point." It pressed twice on a corner block that looked undistinguished to Ames.

He was about to sympathize over the mistake, when the evasive revolving panel in the front wall swung quietly inward. Ames hastily braced it open, so Kelaren could step through first, carrying the flame jet, then Ames walked out. The panel shut promptly behind him, leaving what appeared to be a perfectly solid section of corridor wall.

Kelaren peered in both directions, orienting itself. "This way," it pronounced, and stalked forward.

Ames had to hurry to keep up with the Dashan's longer strides. "Your plan," Ames prompted. "Can I assist in any way?"

Kelaren glanced sideways at him, its owlish face grave. "I would not offend you purposely," it remarked, "but your emotions show so clearly on your face that it is best for you to react to the plan as it unfolds."

"Oh," said Ames, somewhat stung by the implication that he would betray their intentions to the enemy.

"It is best," confided the Zlin. "Your reactions form part of the plan. Our Opponents will be watching you. Yours is a vital role—the Sixth Unexpected Development hinges on their response to your response."

If I was partially confused before, Ames thought to himself, now I'm thoroughly bewildered. Confound the blind spots in my advance briefing! Why couldn't *somebody* write an intelligible explanation of *kirim*?



ABSORBED IN HIS REFLECTIONS, Ames fell behind, and had to run to catch up with Kelaren, who was sweeping around a corner. As soon as they had come to a section with active light strips, Ames had quenched his flame jet and put it away. He was glad that the Dashan seemed to know where it was going. Ames had thought that he might be able to retrace the path of his earlier race through these corridors, but Kelaren kept turning at junctures that Ames didn't recall seeing before. Just as he was convinced that they would never again emerge into the light of day, he suddenly recognized the stairs they were climbing. A few more turns, and they were standing in the deserted consultation room.

Kelaren promptly sat in the carved chair, and with a gesture, drew Ames's attention to a side table brought in since Ames's former visit. Slipping its left hand into its belt pouch to touch the wrapped Handstone, Kelaren thought to the human, "Are you familiar with the device on that table?"

Ames walked over to take a closer view. "It's a beepercom masterset," he thought to Kelaren and the Zlin. "Outsiders are not permitted to bring such devices to Das."

"What are its capabilities?" asked Kelaren.

Ames examined the dial settings, careful not to touch the

equipment. "Communications technology isn't my specialty," he admitted, "but I've been on field expeditions where units similar to this were used. Each person would clip a small unit to his collar. The master unit—like this one—would be set up at the base camp. So long as the individuals stayed within a certain range, they could talk to each other and to the base at any time."

"As I suspected," Kelaren observed. "Can you determine how many of the small units are presently associated with this master set, as you call it?"

Ames searched for the linking network indicator panel. Two microlights burned on the local scale. "Two," Ames reported, "and the capacity for at least three more ranging to a distance beyond the city. That's how they warned your captors that I was coming—by comlink. I knew that had to be the answer, but private com equipment is forbidden on Das. They must be using a scrambled frequency signal to evade detection."

"I should like to speak to my former captor," Kelaren thought. "Only to the two in this House, without allowing any others elsewhere to hear me. Can you arrange such a condition?"

"I think so," responded Ames. "It will let them know where we are, you understand—they'll know we're using their master set."

Kelaren nodded, its face calm. "The Plan requires it."

"If you insist," Ames reluctantly studied the access panel, then adjusted several dials and switches. "Go ahead," he invited. "The sound sensor will broadcast anything said in this room in a normal tone of voice."

"I thank you, Honored Ames," said Kelaren, raising its voice slightly. Ames doubted that the Dashan had ever seen, much less used a communicator before. That presumed lack of experience didn't seem to perturb Kelaren in the least. "Hear me, Impostor who has seized my Name. Hear me, One who calls itself Etrik. I, Kelaren of the Broken Staff, summon you to the Consultation Chamber. It is time to speak of the Handstone of Merlayn."

Nothing like a direct frontal attack, thought Ames.

"No, no," commented the Zlin. "Tactics in *kirin* are far more subtle."

"I was afraid of that," Ames thought back. "No time to discuss the fine points of tactics—here come our erstwhile hosts."

Etrik burst through the doorway first, closely followed by the taller form of the false Kelaren. Each had an illegal neurolyser hand weapon.

The real Kelaren nodded to them, ignoring the threatening weapons. "Greeting," it began, but was cut short by the tall intruder.

"There is no time for Ceremony, nor talk of how you and the Outsider escaped from below. Speak of the Handstone of Merlayn."

"How shall I address you, then," Kelaren countered. "It seems unlikely that we share a name by chance."

The tall Dashan waved its neurolyser irritably. "What matters a name? Call me Radun, and proceed."

"You have already met the Honored Ames," Kelaren persisted.

"Get on with the telling, Timesifter!"

"As you will," Kelaren shut its eye membranes for an instant, then retracted them. Its voice took on the chanting, mnemonic cadence of the Timesifters' Recital of Things Past. "The Handstone of Merlayn: first mentioned in the Birberek

Fragment, estimated date, sixteen hundred years prior to the Great Venture. Relevant extract—"

Kelaren suddenly emitted a piercing whistle which evolved into a wailing cry that raised the hair on the back of Ames's neck. No human throat could have produced such an eerie vocal effect. Words emerged from the song, if so alien an arrangement of sounds could be termed a song. Ames caught a few expressions in the Old High Dashan. As a scholar, he was indignant when Radun interrupted.

"Stop! Keep your ballads for Students of the Old Times. Tell about the Handstone—its appearance, its properties, its powers."

"I am forbidden to do so by my Oath," said Kelaren firmly, "as I told you before. I may demonstrate, but I may not explain."

Etrik moved closer to the chair. Ames recalled that Dashan of the Cold Reaches were reputed to be more volatile than their taller cousins. There was an almost human truculence in its voice as it snarled, "Where is the Handstone? Where has the Outsider hidden it?" Etrik wheeled to face Ames. "You fled with part of our goods. Speak! Did you find the Handstone?"

Ames took a deep breath, but before he could answer, Kelaren quietly remarked, "It is here. I hold it. I am the Keeper of the Handstone. It was freely given to me by the Honored Ames."

Radun leaned forward, its eyes drawn to the shimmering stone plaque in Kelaren's upturned hand. "Give it to me," Radun demanded.

"No," replied Kelaren. "I am the Keeper. If you would consult the Handstone, do so through me. I am the only living Dashan who knows its uses. Do not threaten me, therefore. Without me, the Handstone is no more to you than ordinary rock."

Radun considered, its eyes restlessly flickering around the room, but always returning to the Handstone. "You spoke earlier of demonstration. Proceed now. The Outsider will provide the question."

Ames's throat felt suddenly parched. How could he have gotten involved in this situation? He tried to match Kelaren's serene manner, but his voice faltered as he inquired, "What... what sort of question?"

"By the Traditional Limitations," Kelaren recited, "a Seeker may ask whatever it will, provided that its motive is not selfish gain or desire for evil advantage over others. Advance, Seeker, and place your hand upon the Handstone of Merlayn."

"All will be well," assured the Zlin's silent voice. "Do not hesitate."

Questions streamed through Ames's mind. Almost any historical query should qualify. He stepped forward, raising his right hand to waist level.

"Stop!" snapped Etrik. "Speak aloud your question so that we may hear it."

"It is not traditional for a Seeker to proclaim its question," observed Kelaren in a mild tone.

Radun flourished its weapon. "We modify Tradition. Speak your question, Outsider."

"I have an historical question," said Ames, keenly aware of the ironic aspect of the confrontation. At last he had an unprecedented chance to clarify man's understanding of Dashan history—under circumstances that seemed more suited to a lurid melodrama than scholarly research. "I want to know why the Great Venture was undertaken."

"A suitable question," ruled Kelaren. It had cast aside the *thessl* wrapping. The opalescent Handstone gleamed on its bare, upturned palm, braced on the chair arm.

With an outward show of confidence he was far from feeling. Ames approached the Timesifter.

"Hold your question firmly in mind," murmured Kelaren, as Ames's hand hovered above the enigmatic stone.

Ames pressed his hand onto the smooth, cool surface. Instantaneously, the Consultation Chamber vanished—or to be more precise, Ames's awareness of the room ceased. To the Dashan onlookers, he merely stood there, his eyes shut, a faintly surprised expression frozen on his face. Had he been monitored by medical sensors, slight depressions would have registered in his pulse and respiration. His brainwave activity, on the other hand, increased markedly.

Subjectively, Ames found himself in a featureless gray mist. He wasn't physically aware of his body at all, but paradoxically, he experienced definite auditory and olfactory sensations. Solitary, chiming notes sounded intermittently, and Ames thought that he smelled faint traces of perfume—unfamiliar scents, but pleasant. These realizations were immediately put aside as Ames sensed an enormously powerful mental presence...Merlayn?

It seemed to be all around him, patiently awaiting his question. Question...of course, that was why he was here, to ask an important question. Why was the Great Venture undertaken? No sooner had Ames phrased the question to himself than vivid strokes of color condensed out of the mist. A clear, quiet voice accompanied the chromatic display.

"Trade has been central to Dashan life since the earliest times," it began. "Trade satisfied many needs. When Travelers from outside first came to Das, four planetary years prior to the Great Venture, trade agreements were soon negotiated. With the arrival of Outsiders, Das was exposed to new ways, new ideas. Dashan life, which for may cycles had flowed smoothly, became disrupted by change. Customs long honored were suddenly questioned. Goods and styles of work that had served through generations were found to be lacking. Many Merchants in the cities desired to handle more Outside trade. Finally, the great Venture was proposed. Using machines bought from Outsiders, a large company of Dashan agreed to leave Das, carrying with them items to be traded elsewhere on worlds Outside. For three years, they gathered—the dissatisfied, the venturesome. When all was prepared, they departed, never to return. Those who remained resumed the Old Ways, deciding that unlimited commerce with the Outside would ultimately destroy all that was truly Dashan. Resolves were circulated. At the First Conjunction, it was decided that Tradition must be preserved. Das closed itself to the Outside, allowing only a few restricted exceptions. From that day, it has been so. The Essence of Das has been preserved. Return now, Outsider. Your friends await."

The gray obscurity thickened, blocking out the bright, swirling colors.

"Wait!" pleaded Ames. "There is so much I want to ask."

"Patience," echoed the voice, fading away as the mist dispersed.

Ames blinked his eyes. He was back in the Consultation Chamber, just lifting his hand from the polished plaque. He shook his head to clear away a lingering drowsiness.

"Report," demanded Radun, stooping to gaze at Ames's face for signs of mental damage or deceit.

"Well, it was...I thought I saw...that is to say,"

floundered Ames, trying to put his thoughts in order. "My question was answered, I heard a voice explain the causes of the Great Venture. Chiefly, it agreed with Hilmon's Hypothesis, but I must say, some of the details would surprise him."

"Enough," Etrik interrupted. "That is all your precious Handstone can do, Timesifter?"

"Its purpose is to answer questions by qualified Seekers," Kelaren pointed out. "It has always been thus."

"What if a Seeker disguised its question?" asked Radun. "What if a seemingly innocuous question might lead later to personal gain?"

"No answer would be revealed. It is the nature of the Handstone to distinguish motivations, hidden or proclaimed. Perhaps you have a question," Kelaren pursued. "Or your Master wishes you to convey one?"

Radun ignored the remark. "What about the future? There are tales that predictions could be made by means of the Handstone."

"Sometimes events might be foreshadowed," replied Kelaren, "but the effect is said to have been erratic and not trustworthy."

Ames's attention was distracted from the exchange by the Zlin's abrupt mental intrusion. "Maneuver to a point between our two Opponents," it urged. "Slowly, to avoid alarming them."

Ames complied, easing back one step, then another away from Kelaren's chair. Both Etrik and Radun had moved closer, but they were alert, just out of arm's reach. Ames couldn't see how any plan could help him subdue two wary, armed enemies.

"...physical effects on the Seeker," Radun was saying.

"Express reassurances," prompted the Zlin.

"I found it rather a soothing experience," Ames blurted, edging a bit closer to Etrik while addressing Radun. "No discomfort at all."

Radun appeared skeptical. "But you were not aware of your surroundings. You were entranced."

"I merely shut my eyes to concentrate on the voice giving the answer," asserted Ames. "I knew where I was." Physically, he added to himself—who knew where he had been mentally. "If you have a suitable question, I can recommend this Handstone process—very satisfactory." Ames felt like a merchant trying to press his wares on an unwilling customer.

"Test the Object, Etrik," ordered Radun. "I shall stand guard. You know what it is to be asked."

It was Etrik's turn to exhibit reluctance. "Yes, but you spoke to Gorid last."

Kelaren re-entered the discussion. "A Seeker may not carry a weapon. If you would ask a question, you must set aside that small box, which I assume is a weapon."

Radun thought for a moment, then gestured at Ames with the neurolyser. "Move back, Outsider. Etrik, hold this."

"Now!" shrieked the Zlin. "Seize them—grasp each of them, touching flesh to flesh."

Ames grabbed the startled Etrik's left wrist, and lunged his free hand toward Radun, gripping its bare neck.

Simultaneously, Kelaren sprang from its chair and slapped the Handstone against Radun's cheek. At the instant of that contact, the struggling tableau abruptly stiffened, speechless and immobilized, like an oddly assorted group of statues depicting some obscure ritual.

To Ames, the gray shrouding obscurity swooped back,

cutting him off from all normal frames of reference. This time, however, there were several marked differences from his first experience with the Handstone—no rippling bands of color, no hints of perfume, no isolated musical notes. He was faintly aware of one sound—a single, modulated murmur, like a voice speaking just too far away to be intelligible. Instead of the previous sensation of a single, massive intelligence, Ames now distinguished several sources of mental energy, two of them radiating strongly; the other two subdued, overridden.

Ames waited, expecting that he would be dealt with in turn.

it?" asked Ames, aware of a cold sensation seeping through his mind.

"No," Kelaren admitted calmly. "With the aid of the Handstone, there is no question of resistance. That is why the Handstone must never be permitted to pass to those who would use its powers for evil ends."

"Go ahead, then," thought Ames, bracing himself mentally. "Get on with it."

"Listen," Kelaren invited. "Few from the outside have ever heard the Harp of Merlayn."



Kelly Pease

A quicksilver burst of light darted into Ames's awareness. He was somehow not surprised to be addressed by the tumbling brightness—in this place, it represented the Zlin.

"All goes well," it bubbled. "Kelaren is pleased."

A pillar of cool, blue light loomed through the mist. Kelaren's voice sounded in Ames's mind. "The Fourth Recourse of Kurtees once again proves its worth. Our thanks, Honored Ames, for your assistance." The pillar inclined its upper section in a stylized bow. "It is now necessary to impose upon you some of the restrictions placed on Radun and Etrik."

"What kind of restrictions?" thought Ames uneasily.

"False memories, to be precise," Kelaren responded. "I have learned that a party of unscrupulous Dashan are attempting to acquire the Handstone in order to locate the ruins of Danya, the Lost City. As Keeper of the Handstone, I cannot allow such efforts to succeed. They must be diverted, misled, redirected. For the time being, so must your memories be revised. The effect can be cancelled when events permit. I should prefer your acquiescence."

"It really doesn't matter whether I agree to it or not, does

Ames was about to remark that he heard no music, when a throbbing cascade of crystalline tones enveloped him, swirling into his mind until he lost all consciousness of self.

As suddenly as the music had come, it was gone. Ames opened his eyes. He felt oddly disoriented, unsure of his balance. He was glad to lean against a nearby chair. Other people—there were other people in this room. Ames watched them with detached interest. Two Dashan—one tall, one short—both unsteady on their feet, like sleepwalkers. Ames congratulated himself on the apt description. What were they doing? Fumbling with some equipment on a table near the wall. Ames recognized it as a beepercom set. The tall Dashan was talking, addressing the machine.

"Yes, yes, we recaptured the outsider, but it didn't have the Handstone. We searched it thoroughly. Gorid. It had a few pieces of jewelry, nothing large enough to conceal the Handstone. We already knew all that Kelaren said. No, not of practical use—old ballads, sayings conflicting in detail. The Timesifter claims that its former Teacher might help us, if it's still alive—Regirus of Konor. Yes, we used the hypnorase on both of them. They won't be able to recall any of us. On our

way, now." Radun switched off the masterset.

Etrik helped disconnect the modules and store them in a lined satchel. "Three days wasted," it grumbled. "All that trouble with the imposture, and what have we gained?"

Radun straightened up, giving the satchel strap a final jerk. "We can depend on Gorid to recover all the other jewelry from the Guardians in time. If the Handstone is concealed among those pieces, it will be found. Meanwhile we have a new name to investigate—Regirus of Konor."

"That means four days' riding at the least."

"We are well paid for our efforts," said Radun impatiently. "Come—let us depart before our subjects awaken."

To Ames's surprise, although both Dashan glanced plainly in his direction, both ignored him as if he were transparent. Still muttering complaints, Etrik followed Radun out the door.

Ames pinched himself experimentally. No, he wasn't asleep. He felt confused, though, like a man rudely shaken from a sound sleep. Maybe if he walked around a bit, he could think more clearly. As he turned, he discovered that he wasn't alone. A tall, elderly Dashan with gray-green eyes was silently watching him.

"I'm certain that I have been formally presented to you."

Ames began, straining to attach a name to the vaguely familiar image.

The Dashan glided nearer to offer Ames a goblet of spiced *juntia*. "I am Kelaren of the Broken Staff. You honor my House with your visit."



AMES WELCOMED THE REFRESHMENT almost as much as the brief respite it gave him to retrieve his host's identity. Timesifter—that's who it was.

Ames's memory, usually a competent professional asset, seemed inexplicably unreliable. I must have come here to consult this Kelaren about some historical point, thought Ames. "You are kind to receive me," he replied, hoping that the Dashan would enlighten him further.

"In view of that unfortunate misunderstanding which you related to me last night," Kelaren resumed, "I have requested that the Guardian Multan join us for Morning Meal. Come."

Ames trailed after the Dashan, furiously badgering his memory for details of the previous night's events. Fragments surfaced like flashes of light reflected from rushing water. He remembered riding—a long, tiresome ride in the rain. A pendant—curious gift custom that he'd never heard about before. He fingered his tunic surreptitiously; yes, the pendant was still there. The Zlin... that disconcerting flood of mental advice. Great stars! Now he remembered. The Thieves' Inn—that muddle involving the stolen goods—the frantic escape on yet another lurching werbel. Was there something else he should recall?

Kelaren paused outside a closed door on the left of the passageway.

Ames jerked when the Zlin unexpectedly remarked, "Guardian Multan will welcome a resolution of that matter. I advise you to give the Guardian those items which you accidentally carried away from the Inn."

"Items... items? Where are they?" thought Ames, still confused.

"In your belt wallet," confided the Zlin.

"Oh." Ames felt unusually dense, as if something vital was eluding him.

He passed through the door Kelaren opened. A melancholy looking middle-aged Dashan was standing beside the long

dining table. It bowed courteously to Kelaren, then to Ames.

In his distracted state, Ames's attention wavered away from the formal introductions. He was thinking to himself that the Guardian's olive-colored eyes almost matched the hue of its robes when the Zlin sharply interrupted his musing.

"Attend! Guardian Multan is about to enumerate the charges."

"Therefore, in view of statements by the several Witnesses," droned Multan, "various charges must be considered against you." It ticked the items off on its fingers.

"Representation under False Pretenses, a flagrant breach of Traditional Mutual Accords in your refusal to accept goods submitted for your appraisal, Personal Insult accompanied by Minor Bodily Harm to several persons—among them, two Guardians. I must note—and finally, Unauthorized Removal of a travel-equipped werbel belonging to one Jontor of Escavan." Multan regarded Ames mournfully. "These are grave charges, Archivist Ames. There are numerous traditionally prescribed penalties."

"Cinctured Inversion, Confined Hyperextension, or even Disjointed Interaction, which was employed in earlier times," inserted the Zlin. "As a rule—"

"Will you be quiet!" bellowed Ames, fretted beyond endurance.

The Guardian blinked in astonishment. "I was not speaking," it pointed out.

"I beg your pardon," Ames hastened to apologize. "I wasn't addressing you. It's this cursed pendant that got me into all this trouble in the first place." He jerked the offending object out into view.

Ames wouldn't have believed it possible, but Multan's round eyes seemed to stretch even rounder. "You have been under the influence of a Zlin, Archivist Ames?" it inquired.

It was Ames's turn to be nonplussed. "Well, yes, I suppose you could say that. I was on my way from Takla to Landar when a Dashan I'd never met before insisted that I accept this pendant as a gift."

"Most unusual," murmured Kelaren. "So few Zlins are to be encountered in these latter times."

Multan bobbed its head. "The only known Zlin-host in Takla is Faldar the Merchant. For some time, it has attempted to achieve Gifting Transfer, but of course no mature Trading Citizen would freely accept a Zlin."

Ames seized on the only familiar element in the Guardian's statement. "That's the name! Faldar—it gave me the Zlin."

Multan exchanged a glance with Kelaren, then announced, "All charges against you are therefore nullified."

Bewildered, Ames repeated, "I beg your pardon?"

"As I recall the wording of the relevant Law," Kelaren remarked, "'A Person under Advice of a Zlin is not to be held accountable for Abnormal Behavior committed during such Influence.'"

Ames shook his pendant roughly. "Why didn't you tell me that?" he demanded, addressing the artifact.

Unusually subdued, the Zlin replied, "You might have brought our association to a premature conclusion."

"I certainly would have!" Ames declared. "I suppose your Advice drove Faldar to ruin?"

"On the contrary," the Zlin retorted. "My Advice led directly to my Owner's initial success in the Takla *kirim* Tourney."

"I have a sudden suspicion," Ames said, "that Zlins are not traditionally supposed to advise during *kirim* Tournays."

"Quite correct," observed Multan, entering the one-sided

audible exchange. "Faldar was ejected from this cycle's Tourney and demoted three Experience Levels."

"Please excuse me," Ames apologized. "I was talking to this...this Creature." A cheering thought occurred to him. "As a Guardian, you represent the Dashan legal authority. Can I turn this Zlin over to you?"

Multan blinked in surprise. "Tradition must be observed. You must retain the Zlin until you encounter a suitable Replacement Owner agreeable to all Three Parties."

While Ames contemplated this bleak prospect, the Zlin preserved a prudent silence.

"I do not believe that an Outsider has ever before been chosen Companion by a Zlin," said Kelaren. "This is a most interesting case for your Records, Multan."

The Guardian appeared duly gratified. It turned back to Ames. "I advise you to offer a reasonable sum to the Inn's Moderator to repair the physical damage to its Property. Further, I assume that you wish to relinquish voluntarily possession of Certain Goods inadvertently removed by you from the Inn. I will take custody of them now, if you so desire."

"Gladly," said Ames, rummaging in his wallet. As he set out the stolen jewelry on the table, he asked, "Could you suggest the magnitude of the reasonable sum?"

Multan was pleased to do so. After several minutes of spirited discussion, and an inevitable round of *jantra*, the Guardian rose to leave. It carefully packed the glittering jewelry into an official bag, while declining to stay for the full Morning Meal. Kelaren escorted Multan from the room, exchanging Traditional Valedictions audible to Ames as the two Dashan moved out of sight down the corridor.

Ames sat down at the table, gazing with longing at the array of food on the side shelf. Traditionally, a Dashan guest waited for the Host to serve. Ames was seriously weighing a breach of etiquette against his urgent hunger when Kelaren swept back into the room.

"The Time has come," it announced in brisk tones.

"To serve Morning Meal?" asked Ames hopefully.

"To retrieve your suppressed memories," Kelaren corrected. "Relax your mind, please."

"Picture a calm scene," advised the Zlin.

"Calm! I haven't enjoyed a calm moment since I acquired you," Ames retorted. Suppressed memories—what were they talking about?

The room abruptly shimmered as if viewed through running water. When the walls began to rotate, Ames hastily shut his eyes. He felt a surge of intense vertigo, irrationally accompanied by echoing musical chords. For an instant, he felt very ill indeed, then the swirling sensations in mind and body vanished. Ames cautiously opened his eyes.

The room looked solid, back under normal gravitational restraints. Relieved, Ames slowly stood up. Nice steady floor, not at all like that insubstantial area of gray mist and floating ribbons of color...Triggered by that recollection, a tide of restored memories rushed through Ames's mind. "The Handstone!" he exclaimed. "Radun and Etrik—they've gotten away!"

Kelaren nodded. "As intended."

"But what if they recover their memories?" demanded Ames. "They'll know that they were deceived, that you still have the Handstone."

"They will not remember." The Zlin radiated complete confidence. "They do not possess the services of a Zlin."

"Oh," said Ames, unenlightened.

Kelaren attempted a clarification. "The Zlin means that no other person, save myself, or one of its kind, could restore suppressed memories."

"You didn't want the Handstone mentioned to Guardian Multan," Ames reasoned. "But now I remember everything that happened." He hesitated. "I do remember it all?"

"Completely," assured the Dashan.

"I could tell other people," said Ames.

"Would you be believed?" Kelaren brought a platter of drik-seed cakes to the table. "Consider your position, Honored Ames. You have no proper evidence to support your contentions. The Handstone of Merlayn is a relic of legend. You may claim you have seen it—you would be asked to produce it."

"But you've got it," objected Ames. "I gave it to you."

"I may not acknowledge that fact to any but a qualified few. Furthermore," Kelaren went on, handing Ames a round of greenbread, "I must depart immediately upon a journey which may occupy me for some time. I cannot substantiate your narrative, should you choose to publicize it."

As an historian, Ames was sensitive to the necessity for multiple sources, if possible, against which assertions or theories could be checked and verified. Kelaren was his only articulate source in this matter, if one discounted the Zlin. Ames suspected that Zlins were questionable sources when it came to a matter of law; otherwise, why would there be an exemption from prosecution for acts committed on a Zlin's advice?

"Regrettably," sighed the Zlin. "your trend of thought is correct. We Zlins have long suffered misunderstanding."

"I can imagine," said Ames, with commendable restraint. "You would prefer, then, that I leave certain incidents out of my report?" he continued, addressing the Timesifter.

"Let us say that open disclosure at this time would be of small benefit, while it could assuredly cause great disruption."

Disruption—for some reason, the word echoed in Ames's mind. An elusive trace of memory hovered for a breath just beyond his grasp, and then he knew.

"Danya," he declared. "Radun and those others are looking for the ruins of the Lost City. I remember now. You said they wanted the Handstone to help them locate the ruins somehow."

"You possess an acute mind, Honored Ames," Kelaren made a Gesture of Tribute. "The search for Danya must be mine. More than one Object of Power still exists on Das. Untrained minds, minds filled with greed for power, must not be allowed to acquire such Objects."

"Could I accompany you?" pleaded Ames. "It would be the greatest experience of my life—to seek Danya with hope of actually finding it."

Kelaren shaped a gentle Gesture of Negation. "I would rejoice to share this quest with you, Honored Ames, were it possible. As Keeper of the Handstone, however, I must constantly guard it, preventing the Unqualified from suspecting its location. Radun and Etrik remember you as my Guest. They believe that you came to consult my Records on matters of the Ancient Days. In case they chance to inquire again, you must be here performing your stated duties."

Ames couldn't hide his disappointment. "I understand," he conceded. "If I were to go with you, they might wonder why, and where we were going."

Kelaren nodded gracefully. "It is for the best. Let us complete Morning Meal, and then I shall show you the

arrangement of my Records."

Shortly afterward, feeling considerably more fortified, Ames followed Kelaren into the upper regions of the house. They entered a large, airy room whose walls were lined with massive scroll racks.

Ames simply stared. "The Old Dashan didn't keep written records until the era of the Great Venture," he muttered, half to himself.

"Timesifters of the Old Discipline compiled memory aids beginning many cycles ago," explained Kelaren, slipping a sample scroll free for Ames's inspection.

Ames eagerly scanned the spidery markings ranked in columns across the age-darkened surface. Dismayed, he looked up at Kelaren. "I can't read this—it's not in Old High Dashan."

"An ancient dialect employed by Timesifters," observed the Zlin. "I once spent three cycles as Companion to a Timesifter in the Lesser Desert, and—"

"Then you can read it," crowed Ames.

"Of course. A Zlin learns from each Owner."

Ames felt both exuberant and daunted. There was enough work here to occupy a dozen archivists for years. He said so.

"The Grand Conjunction would not allow so many Outsiders to come to Das at one time," replied Kelaren. "Nor would I allow others to plunder my Records. You alone, Honored Ames, shall be the Resident Timesifter here until my return. Meanwhile, Polor, a Student of mine, is due to return today from a visit to Takla. I have left instructions for your accommodation. Blank scrolls are in this bin; writing materials on this shelf. Now I must depart."

Ames tried to express his gratitude for the exceptional privileges granted him. "You must co-author my final report," he concluded. "I'm sure that what I learn here can advance our understanding of the Dashan past beyond anything I ever dreamed. With your approval, of course."

Kelaren bowed in assent. "Farewell, Honored Ames."

Farewell, Esteemed Zlin. May our Paths again converge in Time."

"May the Light of your Wisdom grow ever brighter," responded the Zlin's interior voice.

Ames stood alone in the Scroll Room. "I do have an Indefinite Permission to Reside on Das," he mused aloud, "and there's always my accumulated planetary leave in case the Center asked for my recall."

He pulled a blank scroll from the bin. The writing surface, felted plant fibers, was archaic, but pleasing to the touch. There was an ample supply of velvety black ink made from certain roots steeped in an acid solution.

Ames began to smile. "Since Das won't allow modern scanning equipment, Stefn will just have to settle for a report handwritten on a scroll." He had to laugh at the mental picture of his chief wrestling with loops of fibrous paper instead of tidy computer plaques.

"All right, Zlin," he challenged. "Roll up your mental sleeves. We've got work to do."

"The translation of ancient scrolls does not promise much excitement," observed the Zlin wistfully. "Shall I recite a Ballad from the Nineteenth Cycle instead?"

"Some other time," countered Ames, spreading a scroll on the work table. "What does this first squiggle mean?"

"It is an Opening Exhortation," said the Zlin. "This scroll was intended to document the Trade network along the River Cavan in the Second Cycle before the Great Venture."

"Splendid," Ames approved. "Just what I came to find out."

"There was a most interesting custom at that time involving knives and Honorary Kinship," offered the Zlin in hopeful tones.

"I don't want to hear about that now," said Ames firmly. "Read on, please."

"There should be scrolls here on the strategy of *kirim*," guessed the Zlin. "That can be a most exciting study."

"Thank you, but I've had quite enough excitement for one trip... for several years, in fact," Ames added. "Back to the Trade Network, if you please. I'm ready to make notes."

"Very well," the Zlin capitulated. "After all," it observed brightly, "Radun and Etrik may come back at any time to check on you."

Ames shuddered. "No wonder there are laws about you Zlins. You must *want* trouble! I merely want to do my work... with your assistance."

The Zlin sighed. Humans, it thought, are peculiar creatures.

Ames was simultaneously thinking the same thing about Zlins.

—G—

I DEMAND THE STARS FOR MY CHILDREN!

[continued from page 38]

educational television station to relieve the monotony. My granddaughter and I were first treated to an excellent illustrated lecture on the principles of rocket flight. The screen then flashed to a picture describing the first rocket ship that was going to leave the earth's surface and go into orbit. President Eisenhower had been waffling around, but finally had decided to let the Vanguard project proceed. I was elated. We Americans were finally going to go somewhere!

An exhausted Amelia finally woke up and dragged herself out of bed. She took her sulky baby from me, and sat down in front of a picture window overlooking the Pacific Ocean. The whimpers changed to croons as the atmosphere in the room changed from cranky tension to contentment. I should have



gone back to bed, but instead I just turned off the sound on the TV, and lay back on the sofa.

I watched Amelia sitting in the flickering light, nursing her baby and staring up at the infinitely deep darkness of the star-speckled blackness, gazing outwards at unseen other worlds as mothers had been doing for millennia. Only now, instead of squatting at the open entrance of a cave illuminated by quivering yellow-red flames, she was rocking at a picture window in a house illuminated by twinkling blue-white images. I was at peace.

Suddenly I heard my daughter gasp in astonishment. My eyes blinked open. Through the window I saw a large star rising slowly over the horizon. The light was not that of an airplane, and it was moving too slowly to be a shooting star. It came drifting overhead, to pass beyond the trees beside the house. I ran back to the television and flipped around the channels to the morning news.

Sputnik! The Russians had beat us into space!

It was really humiliating for the next few years. While we were lobbying a few monkeys and men into the warm waters of the southern Atlantic, the Russians were flashing around in orbit overhead, glancing down with condescension at our meager efforts.

Yet, they were brave, too, those Russian men—and that woman, too. Valentina may have just been along for the ride in an automated capsule, but she still had courage, for space is never safe. Besides, she got to see the world from a height that few would ever see—especially me. At 59 I knew that the highest I would ever fly would be on one of the new jet airplanes that could cruise at almost ten kilometers' altitude.

I was really proud of John Kennedy. Everyone said that the reason that he set the goal of going to the moon was to get people to forget about the Bay of Pigs fiasco. But his was a great challenge, and he brought greatness out of America as it responded to that challenge.

That is what I want out of my country's leaders. I don't want a caretaker that hoards pennies and tries to keep everything the way it always was—you will never win at that game. I want someone that will give me a part of something bigger than just staying alive. We are all on this earth for only a short time. We all have to die sooner or later; so why not do something interesting and long-lasting while we are here?

All of America became involved in the Apollo project. People cared. Sending people out into the hostile environment of space means that you don't take chances. I was explaining this to the children in my kindergarten class. For a successful mission, everything must work correctly. Every bolt must be tight, every part must work, nothing must fail; or the astronauts would die.

I was proud of America. Every worker did their best, everyone felt responsible, no one shirked their responsibilities. Every screw in every capsule, every stitch in every suit, was carefully labored over like Cellini sculpting one of his beautiful golden salt-cellar. It all came together, it all worked.

Some people feel that the culmination of the Apollo program was the first landing upon the moon. I suppose that's true, but to me a close second was the orbiting of the moon by Apollo 8 on Christmas Day 1968. I remember that year well—it was time for me to retire from teaching.

I had flown to Florida to watch the launch. Actually you don't so much watch a launch of a Saturn V as you feel it. The deep rumble stirs the very soil, grabs your innards and shakes them like a terrier, then the sound finally reaches your ears and you stand in awe as the huge cylinder, with its precious cargo perched on top, ponderously lifts itself on tiptoes of flame into the clouds.

20 July 1969. They landed! Everyone saw. A half-billion people in the world watched the same thing. A man on the moon! It had been a fable of the comic books and the Saturday morning movies since you were a child, and now it was here.

You always knew the moon was there, but you never believed that a human being ever really would go there. It was positively thrilling!

The whole world hovered in front of television screens, hoping that the cameras would work so they could show what the moon was really like. Then there were the worries. Suppose there were mechanical problems and they could not take off? There would not be a thing that could be done to save them.

Finally the two ghost-like images climbed back into their spacecraft and started their return trip. As they approached the earth, the apprehension for their safety grew. After all their success, to have it end with an accident seemed almost too much to bear. I was scared. But they made it home safely.

The whole human race was exultant. Nothing of any real significance had happened to the human species for thousands and thousands of years, and suddenly we seemed to be on the move.

But what we thought was a giant leap turned out to be just a baby step. Death even stalked the thirteenth step—yet the men were saved by Mother NASA's multi-redundant protective arms. But was NASA too protective? Was the costly security built into every mission too much?

Any mother could have told them that young children have to be turned loose—to fall if need be—else they will never grow into maturity. The astronauts had courage, but the nation's leaders faltered. Protected, coddled, the Apollo program slowed—as if scared by the darkness outside.

On my 69th birthday I heard some news from my son Robert. He had built a device to measure the gravity field of the moon. He had hoped to get the apparatus on Apollo 17, but the time pressures and the shrinking NASA budgets had caused the experiment to be postponed until the next flight. But there were no more flights....

I now have six grandchildren. One of them calculates interplanetary trajectories for the Pioneer space probes at the Jet Propulsion Laboratory. He used to be at the Cape before they had their big cutback. Another grandchild is busy building the Space Shuttle at Rockwell. Right now they have her gluing the heat shield tiles onto the last two orbiters, but she is concerned about her job because she doesn't see anything coming after that.

My oldest granddaughter earned a Ph.D. in Space Sciences, but that wasn't enough to get her past the second round in the recent astronaut selection competition. She is not discouraged, though. She has qualified for her commercial pilot's license, and is now studying for an M.D. in Aerospace Medicine. The next time they have a competition for new astronauts, she is going to get in—one way or the other. I worry, though. Will there be another selection?

20 July 1979—the tenth anniversary of the first landing on the moon. I go to Washington to visit the Air and Space Museum. My first stop is at the Wright Flyer, where I look up at the 75-year-old antique that is now as old and weary as I am. Carefully making my way through the crowds, I walk over to one side of the huge open room, where an armed man in uniform stands guarding a pedestal. I look at the piece of stone embedded there. I reach out my hand—to touch the moon!

We made a long reach into outer space and now the moon is only an arm's length away.

I reach, but our grasp falters. I yearn, but our ambition fades. This world is too old, too weary, too worn out, too full. This is not what I want. This is not good enough for my children or my grandchildren.

I spent my whole lifetime looking at the light of one sun. There are other suns out there. I want a new light. I want a different light.

I want the stars for my children.

I demand the stars for my children!!!

—G—

THE RINGWORLD ENGINEERS

Larry Niven

Part Two

Synopsis

The Story Thus Far

Twenty-three years after his first visit to the Ringworld, **Louis Wu** has returned. Things have changed.

A wire now carries electric current to the pleasure center of Louis Wu's brain. He was living on Canyon, in hiding, as a wirehead.

Speaker-to-Animals earned his name when he returned the Quantum II hyperdrive motor to the Patriarchy. With a name, status, land, a harem and children, **Chmee** had no intention of leaving known space.

The **Hindmost** has been deposed by a Conservative faction within the puppeteers' Fleet of Worlds. The wealth of the Ringworld would restore his status. To that end he has kidnapped Chmee and Louis Wu.

Their cell aboard *Hot Needle of Inquiry* seems escape-proof. The Hindmost controls Louis's current supply. He had rejuvenated Chmee; only he can back the young Chmee's claim to his own name and property. The puppeteer's control of his alien crew seems complete.

Hot Needle of Inquiry arrives in the Ringworld system. Their first sight of the Ringworld is a shock.

The Ringworld—ring-shaped, with a habitable inner surface three million times the area of Earth—is off center. It will soon grind against the shadow squares—an inner ring of sunshades which provide a day-and-night cycle to the structure—and then against its sun.

This need not affect the Hindmost's limited ambitions. He intends to locate one of the transmutation devices Halroprillalar's species carried on their spacecraft, take it, and return to the Fleet of Worlds.

For Louis and Chmee it's a little more complicated. They know that Halroprillalar's people never had cheap, massive transmutation. She lied. As for the Hindmost's promise to return them to known space when their mission is over... he



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may have lied, too.

Their own best strategy seems to be to take the lander and search the Ringworld on their own. They have done that, and have opened negotiations with a tribe of herd-keeping carnivores. Ostensibly they are seeking the Hindmost's magic transmutation device. In fact, they seek anything that will get them off the Ringworld, or give them some control over their captor, before the Ringworld grinds against its sun.

The night is more active than they had expected. First ghouls, now... giants?

THE GOD GAMBIT (Continued)

THEY MOVED IN A WEDGE formation, with bowmen on the forward arms of the triangle and swordsmen inside, and the one fully armored man at the point. Others had plates of thick leather to guard arms and torsos, but that one—the biggest of the giants—wore metal, a gleaming shell that bulged at elbows, knuckles, shoulders, knees, hips. The forward-jutting mask was open, with a pale beard and wide nose showing inside.

"I was right. I was right all along. But why a Ringworld? Why did they build a Ringworld? How in Finagle's Name did

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they expect to defend it?"

Chmee finished swinging the stun cannon around. "Louis, what are you talking about?"

"The armor. Look at the armor. Haven't you ever been in the Smithsonian Institute? And you saw the pressure suits in the Ringworlder spaceship."

"Uurr... yes. We have a more immediate problem."

"Don't shoot yet. I want to see...yah, I was right. They're going past the village."

"Would you say that the little red ones are our allies? It was only coincidence that we met them first."

"I'd say they are. Tentatively."

The microphone picked up a high-pitched scream, interrupted by a bellow. The archers drew arrows simultaneously, fitted them to bows. Two small red sentries were bounding toward the huts at impressive speed. They were ignored.

"Fire," Louis said softly.

The arrows went wild. The giants crumpled. Two or three green elephants bellowed and tried to get to their feet, paused, settled back. One had a couple of arrows in its flank.

"They were after the herd," Chmee said.

"Yah. We don't really want them slaughtered, do we? Tell

you what, you stay here with the stun cannon and I'll go out and negotiate."

"I don't take your orders, Louis."

"Do you have other suggestions?"

"No. Save at least one giant to answer questions."

This one had fallen on his back. He was not just bearded, he was *maned*: only his eyes and nose showed in a mass of golden hair that spilled over face and head and shoulders. Ginjerof squatted and forced his mouth open with two small hands. The warrior's jaw was massive. His teeth were flat-topped molars, well worn down. *All* of them.

"See," Ginjerof said. "a plant eater. They wanted to kill the herd, to take their grass."

Louis shook his head. "I wouldn't have thought the competition would be so fierce."

"We didn't know. But they come from spinward, where our herds have cropped the grass close. Thank you for killing them, Louis. We must have a great feast."

Louis's stomach lurched. "They're only sleeping. And they've got minds, like you, like me."

She looked at him curiously. "Their minds were turned to our destruction."

"We shot them. We ask you to let them live."

"How? What would they do to us if we let them wake up?"

It was a problem. Louis temporized. "If I solve that, will you let them live? Remember, it was our sleep-gun." And that should suggest to Ginjerfer that Chmee could use the gun again.

"We will confer," said Ginjerfer.

Louis waited, and thought. No way would forty giant herbivores fit in the lander. They could be disarmed, of course. Louis grinned suddenly at the sword in the giant's big, broad-fingered hand. The long curved blade would work as a scythe.

Ginjerfer came back. "They may live, if we never see their tribe again. Can you promise that?"

"You're a bright woman. Yah, they could have relatives with a vengeance tradition. And, yah, I can promise you'll never see this tribe again."

Chmee spoke in his ear. "Louis? You may have to exterminate them!"

"No. It could cost us some time, but, tanj, look at them! Peasants. They can't fight us. At worst I'll make them build a big raft and we'll tow it with the lander. The sunflowers haven't crossed the downstream river yet. We'll let them off a good way away, where there's grass."

"For what? A delay of weeks!"

"For information." Louis turned back to Ginjerfer. "I want the one in the armor, and I want all their weapons. Leave them not so much as a knife. Keep what you want, but I want most of it piled in the lander."

She looked dubiously at the armored giant. "How shall we move him?"

"I'll get a repulsor plate. You tie the rest up after we're gone. Let them loose in pairs. Tell them the situation. Send them to spinward in daylight. If they come back to attack you with no weapons, they're yours. But they won't. They'll cross that plain damn fast, with no weapons and no grass over an inch tall."

She considered. "It seems safe enough. It will be done."

"We'll be at their camp, wherever it is, long before they arrive. We'll wait for them, Ginjerfer."

"They will not be hurt. My promise is for the People," she said coldly.

The armored giant woke shortly after dawn.

His eyes opened, blinked, and focused on a looming orange wall of fur, and yellow eyes, and long claws. He held quite still while his eyes roved: seeing the weapons of thirty comrades piled around him; seeing the airlock, with both doors open; seeing horizon slide past; feeling the wind of the lander's speed.

He tried to roll over.

Louis grinned. He was watching via a scanner in the rec room ceiling while he steered the lander. The giant's armor was soldered to the deck at knees, heels, wrists, and shoulders. A little heat would free him, but rolling around wouldn't.

The giant made demands and threats. He did not plead. Louis paid scant attention. When the computer's translating program started getting sense out of that, he'd notice. At the moment he was more concerned with his view of the giants' camp.

He was a mile up, and fifty miles from the red carnivores' huts. He slowed. The grass hereabouts had had time to grow back; but the giants had left another great bare region behind them, toward the sea and the sunflower gleam beyond. They were out in the grass: thousands of them scattered widely across the veldt. Louis caught points of light glittering from scythe-swords.

No giants were near the camp itself. There were wagons parked near the center of camp, and no sign of draft beasts. The giants must pull the wagons themselves. Or they might

have motors left from the event Halrioprilalar had called the Fall of the Cities, a thousand years ago.

The one thing Louis couldn't see was the central building. He saw only a black spot on his window, a black rectangle overloaded by too much light. Louis grinned. The giants had enlisted the enemy.

A screen lighted. A seductive contralto said, "Louis."

"Here."

"I return your droud," the puppeteer said.

Louis turned. The small black thing was sitting on the stepping disk. Louis turned away as one turns one's back on an enemy, remembering that the enemy is still there.

He said, "There's something I want you to investigate. There are mountains along the base of the rim wall. The natives—"

"For the risks of exploring I selected you and Chmee."

"Can you understand that I might want to minimize those risks?"

"Certainly."

"Then hear me out. I think we'll want to investigate the spill mountains. Before we do, there are just a lot of things we need to know about the rim wall. All you have to—"

"Louis, why did you call them spill mountains?"

"The natives call them that. I don't know why, and neither do they. Suggestive, eh? And they don't show from the back. Why not? Most of the Ringworld is like the mask of a world, with seas and mountains molded into it. But there's *volume* to the spill mountains."

"Suggestive, yes. You must learn the answers yourself. I am called Hindmost, as any leader may be called Hindmost," the puppeteer said, "because he directs his people from safety, because safety is his prerogative and his duty, because his death or injury would be disaster for all. Louis, you've dealt with my kind before!"

"Tanj, I'm only asking you to risk a probe, not your valuable hide! All we need is a running hologram taken along the rim wall. Put the probe in the rim transport loops and decelerate it to solar orbital speed. You'll be using the system just as it's meant to be used. The meteor defense won't fire on the rim wall—"

"Louis, you are trying to outguess a weapon programmed hundreds of thousands of years ago by your reckoning. What if the laser targeting system has become faulty?"

"Even at worst, what have you lost?"

"Half my refuelling capability," said the puppeteer. "I planned stepping disk transmitters in the probes, behind a filter that will pass only deuterium. The receiver is in the fuel tank. To refuel I need only drop a probe in a Ringworld sea. But if I lose that ability, how will I leave the Ringworld? And why should I take that risk?"

Louis held tight to his temper. "The volume, Hindmost! What's inside the spill mountains? There must be hundreds of thousands of those half-cones thirty to forty miles tall, and the backs are flat! One could be the Control and Maintenance Center, or a whole string of them. I don't think they are, but I want to know before I go anywhere near them. Aside from that, there must be attitude jets for the Ringworld, and the best place for them is the rim wall. Where are they and why aren't they working?"

"Are you quite sure they must be rocket motors? There are other solutions. Gravity generators would serve for attitude control."

"I don't believe it. The Ringworld engineers wouldn't need to spin the Ringworld if they had gravity generators. It'd make for a much simpler engineering problem."

"Control of magnetic effects, then, in the sun and the Ringworld floor."

"Mmm... maybe. Tanj, I'm not sure. I want you to find out!"

"How can you dare to bargain with me?" The puppeteer seemed more puzzled than angry. "At my whim you remain

until the Ringworld grinds against the shadow squares. At my whim you will never taste current again."

The translator was finally speaking. "Butt out," Louis said. He'd been given no volume control for the Hindmost's voice; but the Hindmost stopped talking.

The translator said, "Docile? Because I eat plants, must I be docile? Take me out of my armor and I will fight you naked, you ball of orange hair. My space in the longhouse needs a fine new rug."

"And what," Chmee asked, "of these?" He showed polished black claws.

"Give me one tiny dagger against your eight. Or give me none, I will fight without."

Louis was chortling. He used the intercom. "Chmee, haven't you ever seen a bullfight? And this one must be the Patriarch of the herd, the king giant!"

The giant asked, "Who or what was that?"

"That was Louis." Chmee's voice dropped. "There is danger for you. I urge you to be respectful. Louis is... fearsome."

Louis was a little startled. What was this? A reverse God Gambit with the Voice of Louis Wu as guest star? It could work, if Chmee the ferocious kzin was clearly afraid of an unseen voice... Louis said, "King of Plant Eaters, tell me why you attacked my worshippers."

"Their beasts ate our forage," said the giant.

"Was there forage elsewhere, that you could avoid risking my anger?"

Among the males of a herd of cattle or buffalo, one either dominates or submits. There is no middle ground. The giant's eyes rolled, seeking escape, but there was none. If he couldn't dominate Chmee, how could he cow an unseen voice?

"We had no choice," he said. "To spinward are the fire plants. To port are the Machine People. To starboard is a high ridge of exposed *scrith*. Nothing will grow on *scrith*, and it is too slippery to climb. To antispinward is grass, and nothing to stop us but small savages, until you came! What is your power, Louis? Are my men alive?"

"I let your men live. In—" Fifty miles, running naked and hungry? "In two days they will be with you. But I can kill you all with a motion of my finger."

The giant's eyes searched the ceiling, pleading. "If you can kill the fire plants, we will worship you."

Louis settled back to think. Suddenly it was no longer fun.

He heard the giant begging Chmee for information on Louis; he heard Chmee lying outrageously. They'd played such games before. The God Gambit had kept them alive during their long return to the *Liar*; Speaker-to-Animals' reputation as a war god, and the natives' offerings, had kept them out of starvation. Louis hadn't realized that Speaker/Chmee enjoyed it.

Sure, Chmee was having fun. But the giant was pleading for help, and what could Louis do against sunflowers? Actually, it was hardly a problem. The giants had offended him, hadn't they? Gods in general were not noted for forgiveness. So Louis opened his mouth, and closed it again, and thought some more, and said, "For your life and the lives of your people, tell me the truth. Can you eat the fire plants if they do not burn you first?"

The giant answered eagerly. "Yes, Louis. We forage along the border at night, when we grow hungry enough. But we must be far away by dawn! The plants can find us miles away, and they burn anything that moves! They all turn at once, they turn the glare of the sun on us, and we burn!"

"But you can eat them when the sun isn't shining."

"Yes."

"How do the winds blow in this region?"

"Winds? In these parts they blow to spinward. For great distances around, they blow only into the realm of fire plants."

"Because the plants heat the air?"

"Am I a god, to know that?"

After all, the sunflowers only got a certain amount of sunlight. The way they worked, they'd heat the air around and above them, but the sunlight would never pass the silver blossoms to reach the roots. Dew would condense on the cool soil. The plants would get their moisture that way. And rising hot air would bring a steady wind from the borders of the sunflower patch.

And the plants burned anything that moved, to turn plant-eating beasts and birds into fertilizer.

He could do it. He could.

"You will do most of the work yourself," Louis said. "The tribe is yours and you will save them. Afterward you and they will turn toward the dying fire plants. Eat them, or plow them under and plant whatever you like to eat." Louis grinned at Chmee's bewilderment, and continued, "You will never disturb my worshippers, the red people."

The armored giant was gloriously happy. "All of this is most welcome news. Our worship is yours. We must seal the covenant by *rishathra*."

"You're kidding."

"What? No, I spoke of this earlier, but Chmee did not understand. Bargains must be sealed by *rishathra*, even between men and gods. Chmee, this is no problem. You are even of proper size for my women."

"I am stranger than you think," Chmee said.

From Louis's ceiling viewpoint it looked like Chmee was exposing himself to the giant. Certainly something had caused the giant's startled expression. Louis couldn't have cared less. *Tanj dammit!* he thought. *I actually thought of an answer! And now this. What do I have to do to—*

Yah. "I will make for you a servant," Louis said. "Because I am hurried, he will be a dwarf, and mute in your language. Call him Wu. Chmee, we must confer."

THE GRASS GIANTS



THE LANDER TOUCHED DOWN in a malevolent glare of white light. The glare from the longhouse persisted for a minute after the lander stopped moving, then died. Presently the ramp descended. The king giant, fully armored, let it carry him to the ground. He raised his head and bellowed. The sound must have carried for many miles.

Giants began jogging toward the lander.

Chmee descended, then Wu. Wu was small, partly hairless, harmless-looking. He smiled a lot; he looked about him with charming enthusiasm, as if seeing the world for the first time.

The longhouse was a fair distance away. It was mud and grass, reinforced with vertical members. The row of sunflowers planted on the roof shifted restlessly, now turning their concave mirror faces and green photosynthetic nodes to the sun, now flashing at the giants converging from all directions.

Chmee was asking, "What if an enemy attacked in the daytime? How can you reach the longhouse? Or do you store your weapons elsewhere?"

The giant considered before giving away secrets of defense. But Chmee served Louis, and it was well not to offend him. "See you the pile of brush to antispinward of the longhouse? If danger threatens, a man must approach from behind that pile and wave a sheet. The sunflowers fire the damp wood. Under cover of smoke we may then enter and take weapons." He glanced at the lander and added, "An enemy fast enough to reach us before we can reach weapons is too strong for us anyway. Perhaps the sunflowers would surprise him."

"May Wu choose his own mate?"

"Does he have that much volition? I had thought to lend

him my wife Reeth, who has practiced *rishathra* before. She is small, and the Machine People are not so different from Wu."

"Acceptable," Chmee said without a glance at Wu.

A hundred of the giants surrounded them now. No more seemed to be coming. The kzin asked, "Are these all?"

"These and my warriors are all of my tribe. There are twenty-five tribes on the veldt. We stay together when we can, but none speaks for all," the king giant said.

Of the hundred or so, eight were males, and all of the eight were markedly scarred; three were actual cripples. None showed the wrinkles and whitening hair of age. None but the king giant.

The rest were females—rather, they were women. They stood six and a half to seven feet tall, small next to their men: brown-skinned, dignified, naked. Their hair was golden and spilled in wealth down their backs; it was generally a mass of tangles. None bore any kind of decoration. Their legs were thick, their feet large and hard. A few of the women were white-haired. Their heavy breasts gave good indication of their relative ages. They examined their guests with pleasure and wonder, while the armored giant told what he knew of them.

And Chmee, with his translator off, spoke low. "If you prefer one or another female, I must say so now."

"No, they're all about equally... attractive."

"We can still end this situation. You must be mad to make such a promise!"

"I can do it. Hey, don't you want revenge for your burnt pelt?"

"Revenge on a *plant*? You are mad. Our time is precious, and in just over a year they will all be dead—sunflowers, giants, little red carnivores and all!"

"Yah..."

"Your help is no help at all, if they knew it. How long will your project take? A day? A month? You hurt our own project."

"Maybe I am mad. Chmee, I have to carry this through. In all the time since I left the Ringworld I haven't... had reason to be proud of myself. I have to prove—"

The king giant was saying, "Louis himself will tell you that the threat of the fire plants is over for us. He will tell us our part—"

Wu, self-effacing as was his nature, stepped behind the great kzin; and none of the giants particularly noticed that he was talking to his hand. Half a minute later the time-delayed Voice of Louis boomed from the lander, saying, "Hear me, for your day has come to make the places of the fire plants clean for all the breeds of men. My work will go before you as a cloud. You must gather the seeds of what you wish to grow where fire plants grow now..."

In the first light of dawn—when the sun shown overhead as a mere splinter of light at the edge of a shadow square—the giants were at and moving.

They liked to sleep touching each other. The king giant was the center of a circle of women, with Wu at its edge, his small half-bald head pillowed on a woman's shoulder, his legs hooked over a man's long bony legs. The dirt floor was covered in flesh and hair.

Waking, they moved in order, those nearest the door untangling themselves and picking up bags and sickle-swords and moving out, then those further in. Wu moved out with them.

Outside the distant lander a one-armed giant with a marred face said a quick farewell to Chmee and came jogging toward the longhouse. Last night's guards would be sleeping inside during the day, and some older women had stayed, too.

The giants turned and stared openly when Wu began climbing the wall.

The grass and mud surface was crumbly, but the roof was

only twelve feet high. Louis pulled himself up between two sunflowers.

The plants stood a foot tall on a knobby green stalk. Each had a single oval blossom, mirror-surfaced, nine to twelve inches across. A short stalk poked from the mirror's center and ended in a dark green bulb. The back of the blossom was stringy, laced with some vegetable analogue of muscle fibers. And all of the blossoms were throwing sunlight at Louis Wu; but there wasn't enough sunlight to hurt him yet.

Louis wrapped his hands around a thick sunflower stalk and rocked it gently. There was no give; the roots were dug deep



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into the roof. He took off his shirt and held it between the blossom and the sun. The mirror-blossom wavered and rippled in indecision, then folded forward to enclose the green bulb.

Mindful of his audience, Wu climbed down with some attention to style. A white glare followed him as he went to join Chmee.

The kzin said, "I spent part of this night talking to a guard."

"Learn anything?"

"He has the utmost confidence in you, Louis. They're gullible."

"So were the carnivores. I wondered if it was just good manners."

"I think not. The carnivores and the herbivores expect anything at all to walk in from the horizon at any moment. They know that there are people with strange shapes and godlike powers. They make me wonder what we may meet next. Uurrr, and the sentry knew that we are not Engineers. Is this significant?"

"Maybe. What else?"

"There will be no problem with the other tribes. Cattle they may be, but with minds. Those who stay on the veldt will

collect seeds for those who choose to invade sunflower territory. They will give women to the young adult men if they go. Perhaps a third of them will leave when you have worked your magic. The rest will have enough grass. They will not need to move toward the red people."

"Okay."

"I asked about long-term weather."

"Good! Well?"

"The guard is an old man," Chmeece said. "When he was young and had both legs—before something mangled him; the translator said 'ogre'—the sun was always the same brightness and the days were always the same length. Now the sun seems sometimes brighter and sometimes dimmer, and when the sun is bright the days seem too short, and vice versa. Louis, he remembers how it started. Twelve *falans* ago, which would be one hundred and twenty rotations of the constellations, there was a time of dark. Dawn never came for what would have been two or three days. They saw the stars, and a ghost-flame spreading overhead. Then all was as it should be for some *falans*. When the uneven days came, it was long before they noticed; they don't have clocks."

"Seems predictable enough. Except—"

"But the long night, Louis. What does that sound like?"

Louis nodded. "The sun flared up. The shadow square ring closed, somehow. Maybe the wire that holds it together can be reeled in by automatics."

"Then the flare jet pushed the Ringworld off center. Now the days grow more uneven. It frightens all of the races the giants trade with."

"And well it should."

"I wish there were something we could do," The *ksin's* tail lashed, once. "But we battle sunflowers instead. Did you enjoy yourself this night?"

"Yah."

"Then you should be smiling."

"If you really wanted to know, you could have watched. Everyone else did. There aren't any walls in that big building; they all crowd in together. Anyway, they like watching."

"I can't tolerate the smell."

Louis laughed. "It's strong. Not bad, just strong. And I had to stand on a stool. And the women were . . . docile."

"Females should be docile."

"Not human females! They're not even stupid. I couldn't talk, of course, but I listened." Louis's forefinger tapped the knob in his ear. "I listened to Reeth organizing the cleanup squad. She's good. Hey, you were right, they're organized just like a herd of cattle! The females are all the wives of the king giant. None of the other males ever gets laid, except that sometimes the king giant declares a holiday and then goes away so he won't have to watch. Fun's over when he comes back, and officially nothing happened. Everyone's a little miffed because we brought him back from the raid two days early."

"What are human females supposed to be like?"

"Oh . . . orgasm. The males of all the mammals have orgasms. The females generally don't. But human women do. But the giant women, they just accept. They don't . . . ah . . . participate."

"You didn't enjoy it?"

"Of course I enjoyed it. It's sex, isn't it? But it takes a little getting used to that I couldn't make Reeth enjoy it like I did, that she can't."

"My sympathy is all that that should be," Chmeece said, "considering that my nearest wife is two hundred light years away. What must we do next?"

"Wait for the king giant. He may be a little groggy. He spent a lot of last night getting re-acquainted with his wives. In fact, the only way he had to tell me how was by demonstration. He's awesome," Louis said. "He . . . serviced? He serviced a dozen women, and I tried like tanj to keep up with him, but it didn't help my ego that . . . skip it." Now Louis was grinning.

Larry Niven

"Louis?"

"My reproductive set isn't built to the same scale."

"The guard said that the females of other species stand in awe of the giant males. The males practice *rishathra* whenever they can. They enjoy peace conferences immensely. The guard was annoyed that Louis did not make you female."

"Louis was in a hurry," Wu said, and he went in.

Last night the gatherers' big bags had disgorged a great heap of cut grass some distance from the longhouse. Guards and the king giant had eaten most of the pile; the gatherers must have been eating as they worked. Now Louis watched as the king giant, loping toward the lander, stopped to finish off the pile.

Herbivores spent too much of their lives eating, Louis mused. How had the humanoids kept their intelligence? Chmeece was right, you didn't need intelligence to sneak up on a blade of grass. Maybe it took intelligence to avoid being eaten. Or—it took considerable cunning to sneak up on a sunflower.

Louis felt himself being watched.

He turned. Nothing.

It would be embarrassing at best if the king giant learned he'd been duped. Yet Louis was all alone on the flight deck, if you ignored the Hindmost's spy-eyes. Why this tingling at the back of his neck? He turned again, and who was he kidding? It was the droud. The black plastic case was staring at him from the stepping disk.

A touch of the wire would really make him feel like a god. It would really louse up his act, too! He remembered that Chmeece had seen him under the wire. "Like a mindless marine plant . . ." He turned away.

The king giant came without armor today. As he and Chmeece entered the rec room the *ksin* raised his hands to the ceiling, palms together, and intoned, "Louis." The giant imitated him.

"Find me one of the repulsor plates," Louis said without preamble. "Set it out on the floor. Good. Now get some of the superconductor cloth. It's three doors down, the big locker. Good. Wrap the cloth around the repulsor plate. Cover it completely, but leave a fold so you can reach the settings. Chmeece, how strong is that cloth?"

"A moment, Louis . . . see, it cuts with a knife. I don't think I could rip it."

"Good. Now get me twenty miles of the superconducting wire. Wrap one end around the repulsor plate. Tie it good, use a lot of loops. Be lavish. Good enough. Now, coil the rest of the wire so it won't tangle when you let it out. I need the other endpoint. Chmeece, you do that. King of the Grass Eaters, I need the biggest rock you can carry. You know this territory. Find it and bring it."

The king giant stared, and dropped his eyes, and went. Chmeece said, "It sours my stomach to take your orders so meekly."

"But you thought of it, and besides that, you're dying to find out what I'm planning. But—"

"I could make you tell."

"I can make you a better offer than that. Come up here, please."

Chmeece bounded up through the hatch. Louis asked, "What do you see on the stepping disk?"

Chmeece picked up the droud.

Louis's voice was jagged in his throat. "Break it."

The *ksin* instantly stiff-armed the small instrument into a wall. It didn't dent. He pried at the casing, got it open, and jabbed at the inside with the hullmetal blade of the knife he'd been using. At last he said, "It's beyond repair."

"Good."

"I will wait below."

"No. I'll come with you. I want to check your work. And I

want breakfast." He was feeling twitchy. He wasn't sure how he felt. *Rishathra* hadn't quite lived up to his expectations, and the pure joy of the wire was over forever. But...cheese fondue? Right. And freedom, and pride. In a couple of hours he was going to wipe out a sunflower invasion and shock tanj out of Chmeece. Louis Wu, ex-wirehead, whose brain hopefully had not turned to oatmeal after all.

The king giant came back hugging a boulder and moving very slowly. Chmeece started to take it from him, hesitated an instant as he saw its size, and finished the motion. He turned with it in his arms and, with strain just showing in his voice, said, "What must I do with it, Louis?"

It was tempting. *Oh, there are so many possibilities... give me a minute to think it over...* But gods don't dither, and he couldn't let Chmeece drop it with the giant watching.

"Set it on superconductor cloth and wrap it up. Tie it with superconductor wire. Take a lot of turns around the rock, and be lavish with the knots, too. Okay, now I want some stronger wire that'll stand up to heat."

"We have Sinclair molecule chain."

"Less than twenty miles of that. I want it shorter than the superconductor wire." Louis was glad he'd made the inspection. He had overlooked the chance that the superconductor wire wouldn't be strong enough to hold the cloth-wrapped repulsor plate, once the plate reached altitude. But Sinclair chain was fantastic stuff. It ought to hold.

SUNFLOWERS

LOUIS FLEW HIGH AND FAST TO SPINWARD. The veldt showed too much brown: grass cropped first by the green elephants and then by giants was having trouble growing back. Ahead, the white line of sunflowers glared across the sea.

The king giant watched through the transparent airlock doors. "It may be I should have brought armor," he said.

Chmeece snorted. "To fight sunflowers? Metal grows hot."

"Where," Louis asked, "did you get the armor?"

"We made a road for the Machine People. They made us free of the grasslands which the road was to go through, and afterward they made armor for the kings of the tribes. We kept moving. We didn't like their air."

"What's wrong with it?"

"It tastes wrong and smells wrong, Louis. It smells like what they drink sometimes. They pour the same stuff in their machines, but without mixing it with anything."

Chmeece asked, "I wondered about the shape of your armor. It is not quite your own shape. I wondered why."

"The shape is meant to awe and frighten. Did you not find it so?"

"No," said Chmeece. "Is it the shape of those who built the Ringworld?"

"Who knows?"

"I do," Louis said. The giant's eyes flicked nervously upward.

The grass, grown tall again, abruptly gave way to forest. The sunflowers had grown bright. Louis dropped the lander to a hundred feet and slowed drastically.

The forest ended in a long white beach. Louis slowed further and eased the lander down, down, until he was almost skimming the water. The sunflowers lost interest.

He flew on toward the diminished glare. The sea was calm, rippled by a breeze from astern. The sky was blue and cloudless. Islands went by, small and medium-sized, with beaches and convoluted shores and peaks charred black. Two had been commanded by sunflowers.

Fifty miles offshore, the sunflowers were taking an interest again. Louis brought the lander to a halt. "They can't hope to use us for fertilizer," he said. "We're too far away and flying too low."

"Brainless plants." Chmeece coughed contempt.

The king giant said, "They are clever. They start brushfires. When only ashen ground is left, the fire plants spread their seed."

But they were over water! Skip it. "King of the Grass People, this is your hour. Drop the rock overboard. Don't snag the wire." Louis opened the airlock and lowered the ramp. The king giant went forth into the ominous glare. The boulder fell twenty feet into the water, trailing black and silver wires.

Spotlights seemed to wink at them from the far shore, as clusters of the plants tried to burn the lander, then lost interest. They sought motion, but they wouldn't fire on running water, would they? On a waterfall, say? The plants did best on half-arid worlds. "Chmeece. Take the repulsor plate outside. Set it for, oh, eighteen miles. See that the wires don't foul."

The black rectangle rose. Wire trailed, black and silver. The thread of Sinclair chain should have been invisibly thin, but it glowed silver, and a bright nimbus glowed around the dwindling repulsor plate. The plate was a black dot now, harder to see than the bright halo around it. At that altitude it was a target for hordes of sunflower blossoms.

A superconductor will pass an electric current with no resistance whatever. It is this property which makes it so valuable to industry. But superconductors have another property. A superconductor is always the same temperature throughout.

Air and dust particles, and Sinclair wire, glowed by sunflower light. But the superconductor cloth and wire remained black. Good. Louis blinked away the dazzle and looked down at the water. "King of the Grass People," he said, "Come inside before you're hurt."

Where the two wires entered the water, the water boiled. A streamer of steam blew into the white glare to spinward. Louis set the lander drifting to starboard. Already a fair patch of water was steaming.

The Ringworld engineers had built only two deep oceans, the Great Oceans, counterbalanced opposite each other. The rest of the Ringworld's seas were twenty-five feet deep throughout. Like humans, they apparently used only the top of a sea. That was to Louis's advantage. It was making it easier to boil a sea.

The steam cloud reached for shore.

Gods don't gloat. That was a pity. "We will watch until you are satisfied," he told the king giant.

"Uurr," said Chmeece.

"I begin to see," the king giant said, "but..."

"Speak."

"The fire plants burn away clouds."

Louis swallowed uneasiness. "We will watch. Chmeece, you may offer our guest lettuce. It may be that you will want to eat with a door between you."

They were fifty miles to starboard of the anchored wire, on the port side of a tall, bare island. The island cut half the glare of those sunflowers still interested in cremating the lander, but most of the sunflowers were distracted anyway. Some of the glare focused on the hovering black rectangle; some on the steam cloud.

For the water was steaming for a couple of square miles around the wire and submerged boulder. The steam ran in a spreading cloud across the sea, fifty miles to shore, and there it caught fire. Five miles inland it ran, burning like a firestorm, and then it was gone.

Louis focused the telescope on the patch of steam. He could see water boiling. Plants would be starting to die. A five-mile strip of plants was getting no sunlight; plants around them were wasting their light on a steam cloud instead of making sugar with it. But a five-mile strip was nothing, nothing. The patch was half the size of a world.

He saw something else, that made him swing the view straight upward.

The silver wire was falling, drifting to spinward in the wind. The sunflowers had burned through Sinclair molecule chain. Louis softly spoke a one-syllable word meaning "impotence." But the thread of superconductor was still black.

It would hold. Sure it would.

It would be no hotter than boiling water, and everywhere the same temperature. More light from the plants wouldn't change that; it would only boil the water faster. And this was a big sea. And water vapor doesn't just vanish. Heat it and it rises.

"Gods eat well," the king giant said. He was munching on a head of Boston butter lettuce: his twentieth or maybe thirtieth. He stood beside Chmee, watching, and like Chmee he did not speculate on what was happening outside.

Seawater boiled merrily. The sunflowers were sure as tanj determined to knock down that bit of potential fertilizer, that possible sunflower-eating bird. They couldn't judge altitude or distance. Evolution wouldn't let them keep that up until they starved. Time off for each blossom to focus on the green photosynthetic node, while others took turns.

Quietly Chmee said, "Louis. The island."

Something large and black stood waist deep in the water offshore. It was not human and not otter, but a little of both. It waited patiently, watching the lander with large brown eyes.

Louis spoke calmly, but with effort. "Is this sea peopled?"

"We did not know it," said the king giant.

Louis slid the lander toward the beach. The humanoid waited without fear. He was covered with short, oily black fur, and nicely streamlined: thick neck, drastically sloping shoulders, a broad nose flattened against his chinless face.

Louis activated the microphones. "Do you use the speech of the Grass People?"

"I can use it. Talk slowly. What are you doing there?"

Louis sighed. "Heating the sea."

The creature's self-possession was remarkable. The idea of heating a sea didn't faze him. He asked the mobile building, "How hot?"

"Very hot at this end. How many are you?"

"Thirty-four of us now," said the amphibian. "We were eighteen when we came here fifty-one *falans* past. Will the starboard part of the sea grow hot?"

Louis sagged with relief. He'd had visions of hundreds of thousands of people cooked because Louis Wu had played god. He croaked, "You tell me. The river inlet's at that end. How much warmth can you stand?"

"Some. We will eat better; fish like warmth. It is polite to ask before you destroy even part of a home. Why are you doing this?"

"To kill off the fire plants."

The amphibian considered. "Good. If the fire plants die, we can send a messenger upstream to Fubobish's Son's Sea. They must think us long dead." He added, "I forget my manners. *Rishathra* is acceptable to us, if you will state your sex, and if you can function underwater."

Louis needed a moment to regain his voice. "None of us mate in water."

"Few do," said the amphibian, with no obvious disappointment.

"How did you come here?"

"We were exploring downstream. Rapids carried us into the realm of the fire plants. We could not go ashore to walk. We must let the river carry us to this place, which I named Tuppugop's Sea, for myself. It is a good place, though one must be wary of the fire plants. Can you really kill them with fog?"

"I think so."

"I must move my people," the amphibian said. He

disappeared without a splash.

"I thought you would kill him," Chmee told the ceiling, "for his impudence."

"It's his home," said Louis. He turned off the intercom. He was weary of the game. I'm boiling someone's *home*, he thought, and I don't even know it'll work! He wanted the droud. Nothing else could help, nothing but the vegetable happiness of current running in his brain, nothing else would stop the black rage that had him pounding his chair arms and making animal noises with his eyes squeezed tightly shut.

That, and time. Time passed, and the spell passed, and he opened his eyes.

He couldn't see the black wire now, nor even the boiling of the water. It was all a vast fog bank drifting to spinward, catching fire as it reached shore, ten miles inward and gone. Then only the flare of sunflowers—and a pair of parallel lines at the horizon.

White line above, black below, across fifty degrees of horizon.

Water vapor doesn't just disappear. Heated, it had gone up, and recondensed in the stratosphere. White edge of cloud, blazing under sunflower attack; black shadow across a tremendous patch of sunflowers. It must be five hundred to a thousand miles away, to be seen so near to its own shadow, and hundreds of miles across. And it was spreading—excruciatingly slowly, but it was spreading.

In the stratosphere the air would be forced *outward* from the center of the sunflower patch. Some of the cloud would rain out, but some water vapor would meet the steam from the boiling sea and flow inward, recirculating.

His arms hurt. Louis realized that he had a death grip on the chair arms. He let go. He turned on the intercom.

"Louis has kept his promise," the king giant was saying, "but the dying plants may be out of our reach. I don't know—"

"We'll spend the night here," Louis told them. "In the morning we'll know better."

He set the lander on the antispinward side of the island. Seaweed had washed ashore in great heaps. Chmee and the king giant spent an hour stuffing seaweed into a hatch in the lander's hull, feeding the converter-kitchen with raw material. Louis took the opportunity to call *Hot Needle of Inquiry*.

The Hindmost was not on the flight deck. He must be in the hidden part of *Needle*. "You have broken your droud," he said.

"I know it. Have you done anything—"

"I have a replacement."

"I don't care if you've got a dozen. I quit. Do you still want the Ringworld engineers' transmutor?"

"Of course."

"Then let's cooperate a little. The Ringworld Control Center has to be somewhere. If it's been built into one of the spill mountains, then the transmutors that came off the ships on the spaceport ledge *have* to be there. I want to know everything about the situation before I go into it."

The Hindmost thought it through.

Behind his flat weaving heads, massive buildings glowed with light. A wide street, with stepping disks at intersections, dwindled to a vanishing point. The street swarmed with puppeteers. Their coiffured manes glowed in glorious variety; they seemed always to move in groups. In a sliver of sky between buildings two farming worlds hovered, each surrounded by orbiting points of light. There was a background sound like alien music, or like a million puppeteers holding conversations too far away to be heard clearly.

The Hindmost had a piece of his lost civilization here: tapes and a holo wall and, probably, the smell of his own kind constantly in the air. His furniture was all soft curves, with no sharp corners to bump a knee on. An oddly-shaped

indentation in the floor was probably a bed.

"The back of the rim wall is quite flat," the Hindmost said abruptly. "My deep-radar won't penetrate it. I can afford to risk one of my probes. It will still serve as a relay between *Needle* and the lander; in fact, it will serve better as it rises higher. Accordingly I will place a probe in the rim wall transport system."

"Good enough."

"Do you really think the Repair Center is—"

"No, not really, but we'll find enough surprises to keep us entertained. It should be checked out."

"One day we must decide who rules this expedition," the puppeteer said. He disappeared from the screen.

There were no stars that night.

Morning was a brightening of chaos. From the flight deck nothing showed but a formless pearly glow; no sky, no sea, no beach. Louis was tempted to recreate Wu, just to step out and see if the world was still there.

Instead he took the lander up. There was sunlight at three hundred feet. Below was nothing but white cloud, glowing brighter at the spinward horizon. The fog had spread a long way inland.

The repulsor plate was still in place, a black dot just overhead.

Two hours after dawn, a wind swept the fog away like raising a curtain. Louis dropped the lander to sea level before the edge reached shore. Minutes later a bright nimbus formed around the repulsor plate.

The king giant had been at the airlock doors all morning, watching, absently stuffing his face with lettuce. Chmee, too, had been almost silent. They turned toward the ceiling when Louis spoke.

"It will work," he said, and finally he believed it. "Soon you will find an alley of dead sunflowers leading to a much bigger patch of them under a permanent cloud deck. Sow your seeds. If you'd rather eat live fire plants, forage at night on both sides of the streamer of fog. You may want a base on some island in this sea. You'll want boats."

"We can make our own plans now," the king giant said. "It will help to have Sea People near, even so few. They trade service for metal tools. They can build our boats. Will grass grow in all this rain?"

"I don't know. You'd better seed the burned-off islands, too."

"Good. For our special heroes we carve their likeness on a rock, with a few words. We are migratory; we can't carry large statues with us. Is this adequate?"

"Certainly."

"What is your likeness?"

"I'm a little bigger than Chmee, with more hair around the shoulders, and the hair is your own color. Carnivore teeth, with fangs. No external ears. Don't go to too much trouble. Where shall we take you now?"

"To our camp. Then I think I must take a few women and scout the edges of the sea."

"We can do that now."

The king giant laughed. "Our thanks, Louis, but... My warriors will be in an ugly mood when they return. Naked, hungry, defeated. It may go better for them when they learn that I am gone for a few days. I am no god. A hero must have warriors happy with his rule. He cannot be fighting every waking hour."

ORIGINS

THE LANDER CRUISED FIVE MILES UP at just under sonic speed.

Thirteen thousand miles was no great distance for the lander. Louis's caution irked the kzin. "Two hours and we can be dropping onto the floating city, or rising

from underneath! One hour, without serious discomfort!"

"Sure. We'd have to go out of the atmosphere with the fusion drive blazing like a star, but sure. Remember how we reached Halloprillalar's floating jail? Upside down in midair, with the motors burned out of our flycycles?"

Chmee's tail thumped the back of his chair. He remembered.

"We don't want to be noticed by any old machinery. The superconductor plague doesn't seem to have got it all."

Grassland gave way to patterns of cultivation, then to a watery jungle. Vertical sunlight reflected back at them from between the trunks of flowering trees.

Louis was feeling wonderful. He wouldn't let himself see the futility of his war on the sunflower patch. It had *worked*. He had set himself a task; he had accomplished it with intelligence and the tools at hand.

The swamp seemed to go on forever. Once Chmee pointed out a small city. It was difficult to see, with water half-drowning the buildings, and vines and trees trying to pull them down. The architectural style was strange. Every wall and roof and door bulged outward a little, leaving the streets narrow in the center. *Not* built by Halloprillalar's people.

By midday the lander had traveled further than Ginjerifer or the giant king would travel in their lifetimes. Louis had been foolish to question savages. They were as far from the floating city as any two points on Earth.

The Hindmost called.

Today his mane was a swirling rainbow, dyed in streamers of primary colors. Behind him puppeteers flickered along lines of stepping disks, clustered at shop windows, brushed against each other without apology or resentment, all in a murmur of music with flutes and clarinets predominating; puppeteer language. The Hindmost asked, "What have you learned?"

"Little," said Chmee. "We have wasted time. There was certainly a great solar flare seventeen *falans* ago—about three and a half years—but we guessed that much. The shadow squares closed to protect the surface. Their guidance system must operate independently of the Ringworld's."

"We could guess that, too. No more?"

"Louis's hypothetical Repair Center is certainly inactive. This swamp below us was not designed. I imagine a majority of hominids, some intelligent, some not. Of those who built the Ringworld we find no trace, unless they were Halloprillalar's ancestors. I am inclined to think they were."

Louis opened his mouth, and glanced down at a threshold pain in his leg. He found four kzin claws just resting on his thigh. He shut his mouth. Chmee continued, "We have not met any of Halloprillalar's species. Perhaps they were never a dense population. We hear rumors of another race, the Machine People, who may rise to replace them. We go to seek them."

"The Repair Center is inactive, yes," the Hindmost said briskly. "I have learned much. I have put a probe to work—"

"You have two probes," Chmee said. "Use both."

"I hold one in reserve, to refuel *Needle*. With the other I have learned the secret of the spill mountains. See—"

The far right screen showed a probe's eye-view. It raced along the rim wall; passed something, too quick for detail; slowed, turned, moved back.

"Louis advised me to explore the rim wall. The probe had barely started its deceleration routine when it found this. I thought it worth investigating."

There was a swelling on the rim wall—a tube hooked over the lip. It was molded, flattened against the rim wall, and was made of the same translucent gray *scrith*. The probe eased toward it, until the camera was looking up into a pipe a quarter mile across.

"Much of the Ringworld's design shows a brute force approach," the Hindmost was saying. And the probe moved

THE RINGWORLD ENGINEERS



alongside the pipe, over the lip and down the outer face of the rim wall, to where the pipe disappeared into the foamed material that formed a meteor shield for the Ringworld's underside.

"I see," Louis said. "And it wasn't working?"

"No. I tried to trace the pipe and had some success."

The scene jumped. Now it showed dark racing motion as the probe cruised a good distance outward from the Ringworld. Inverted landscape passed above, seen by infrared light. The probe slowed, stopped, moved upward.

If a meteor struck the Ringworld, it had to fall first from



Cortney Skinner

interstellar space; and it struck with that velocity plus the Ringworld's own 770 miles per second. A meteor had struck here. The plasma cloud had drawn a savage gouge across hundreds of miles of seabottom, vaporizing the protective foam. There in the gouge was a length of pipe a few hundred feet in diameter. It led up into the seabottom.

"A recycling system," Louis murmured.

The puppeteer said, "Without some counterbalance to erosion, the Ringworld's topsoil would all be in the sea bottoms in a few thousand years. I expect the pipes run from the sea bottoms along the underside and up over the rim wall. They deposit seabottom sludge on the spill mountains. Much of the water would boil away in the near-vacuum at the peak, thirty miles high. The mountain gradually collapses under its own weight. Material moves from the rim walls inward, carried by winds and rivers."

Chmeece said, "Mere supposition, but plausible. Hindmost, where is your probe now?"

"I intend to bring it out from under the Ringworld and re-insert it into the rim transport system."

"Do that. Does the probe have deep-radar?"

"Yes, but the range is short."

"Deep-radar the spill mountains. The spill mountains

are... perhaps twenty to thirty thousand miles apart? Thus we may find on the order of fifty thousand spill mountains along both rim walls. A handful of those would make a fine hiding place for the Repair Center."

"But why should the Repair Center be hidden?"

Chmeece made a rude noise. "What if the subject races should revolt? What of an invasion? Of course the Repair Center is hidden, and fortified, too. Search every spill mountain."

"Very well. I will scan the starboard rim wall in one Ringworld rotation."

"Scan the other rim afterward."

Louis said, "Keep the camera going, too. We're still looking for attitude jets... though I'm starting to think they had something else going."

The Hindmost clicked off. Louis turned to the window. It had been tickling at his attention all along: a slender pale thread that curved along the edge of the swamp, straighter than a river. Now he pointed out the barely visible pair of dots moving along its length. "I think we need a closer look at that. Why don't you take us down?"

It was a road. From a hundred feet up it was rough-surfaced, stony stuff: white stone pouted in a stream. Louis said, "The Machine People, I presume. Shall we track those vehicles?"

"Let us wait until we are closer to the floating city."

Giving up a present opportunity seemed silly, but Louis was afraid to object. The kzin's tension was thick enough to smell.

The road avoided the low, wet areas. It seemed in good repair. Chmeece followed it at low speed, a hundred feet up.

Once they passed a handful of buildings, the biggest of which seemed to be a chemical plant. Several times they watched boxy vehicles pass below them. They were seen only once. A box stopped suddenly, and humanoid shapes spilled out, ran in circles, then produced sticks which they pointed at the lander. A moment later they were out of sight.

There were great pale shapes in the wet jungle. They couldn't be glacier-scoured boulders; not here. Louis wondered if they might be tremendous fungi. He stopped wondering when he saw one move. He tried to point it out to Chmeece. The kzin ignored him.

The road curved away to antispinward as it approached a range of craggy mountains; it jogged through a notch in the range, rather than carving its own path, then jogged right to run alongside the swamp again.

But Chmeece swerved left and accelerated. The lander streaked along the portward side of the range, trailing a plume of fire. Abruptly the kzin spun the lander around, braked, and set down at the foot of a granite cliff.

He said, "Let us step outside."

The scritch shell of the mountain would block the Hindmost's microphones; but they'd feel still safer outside the lander. Louis followed the kzin.

The day was bright and sunny—too bright, as this arc of the Ringworld approached its nearest point to the sun. A stiff warm wind was blowing. The kzin asked, "Louis, were you about to tell the Hindmost of the Ringworld engineers?"

"Probably. Why not?"

"I assume we've come to the same conclusion."

"Doubtful. What would a kzin know of Pak protectors?"

"I know everything in the records of the Smithsonian Institute, what little there is. I have studied the testimony of the asteroid belt miner, Jack Brennan, and holos of the mummified remains of the alien, Phssthpok, and the cargo pod from his ship."

"Chmeece, how did you get hold of that stuff?"

"Does it matter? I was a diplomat. The existence of the Pak has been a Patriarch's Secret for generations, but any kzin who must deal with humans is required to study the records.

We learn to know our enemy. I may know more of your ancestry than you do. And I surmise that the Ringworld was built by Pak."

Six hundred years before Louis Wu's birth, a Pak protector arrived in Sol system on a mission of mercy. It was through this Phssthok, via the Belter Jack Brennan, that historians learned the rest of the story.

The Pak were native to a world in the galactic core. They lived their lives in three stages: child, breeder, protector. The adults, or breeders, were just intelligent enough to swing a club or throw a stone.

In middle age, if they lived long enough, Pak breeders developed a compulsion to gorge on the plant called *tree-of-life*. A symbiotic virus in the plant triggered the change. The breeder lost its gonads and teeth. Its skull and brain expanded. Lips and gums fused into a hard, blunt beak. Its skin wrinkled and thickened and hardened. Its joints became enlarged, offering a larger moment arm to the muscles, increasing their strength. A two-chambered heart developed in the groin.

Phssthok came tracking a Pak colony ship that had reached Earth more than two million years earlier.

The Pak were in a constant state of war. Previous colonies to nearby worlds in the galactic core had always been overrun by subsequent waves of ships. Perhaps that was the reason this ship had come so far.

The colony was large and well-equipped, and guided by beings tougher and smarter than humans. It had failed nonetheless. *Tree-of-life* grew in Earth's soil, but the virus didn't. The protectors had died out, leaving a lost population of Pak breeders to fend for themselves—and leaving records of a cry for help that had crossed thirty thousand light-years to the Pak home world.

Phssthok found those records in an ancient Pak library. And Phssthok crossed thirty thousand light years, all alone in a slower-than-light craft, seeking Sol system. The resources that built that craft, in knowledge and minds and materials, were resources Phssthok had conquered and held by war. His cargo pod was jammed with *tree-of-life* roots and seeds, and bags of thallium oxide. His own research had discovered the need for that unusual soil additive.

It might have occurred to him that the breeders would mutate.

Among the Pak a mutant stood no chance. If the children smelled wrong to their protector forefathers, they were killed. On Earth, perhaps Phssthok counted on a lesser mutation rate, this far from the savage cosmic ray density among the core suns. Perhaps he took his chances.

The breeders had mutated. By Phssthok's time they showed little resemblance to the Pak breeder, barring certain changes at middle age, when the production of eggs stopped in females, and when both sexes showed wrinkling of skin, lost teeth, swelling of joints, and a restlessness and dissatisfaction that was all that remained of the hunger for *tree-of-life*. Later in life, heart attacks would result from the lack of the second heart.

Phssthok learned none of this. The rescuer died almost painlessly, with no more than a suspicion that those he intended to rescue had become monsters, and had no need of him at all.

Such was the tale that Jack Brennan told to United Nations representatives before his disappearance. But Phssthok was dead by then, and Jack Brennan's testimony was doubtful. He had eaten *tree-of-life*. He had become a monster; his brain case in particular was expanded and distorted. Perhaps he had become mad, too.

It was as if a load of spinach noodles had been spilled all over this rocky area. Strips of greenery, fuzzy to the touch, hugged the ground in places where dirt had packed itself

between the boulders. Clouds of insects buzzed around their ankles, staying within inches of the ground.

"Pak protectors," said Louis. "That's what I thought, but I've been having trouble making myself believe it."

Chmeece said, "The vacuum suits and the Grass Giant's armor show their shape: humanoid, but with enlarged joints and a face pushed forward. There is more proof. We've met so many hominids, all different. They had to be derived from a common ancestor: your own ancestor, the Pak breeder."

"Sure. It'd also tell us how Prill died."

"Does it?"

"Boosterspace was tailored for *Homo sapiens* metabolism. Halroprillalar couldn't use it. She had her own longevity drug, and it could be used by a number of species. It struck me that Prill's people might have made it from *tree-of-life*."

"Why?"

"Well, the protectors lived thousands of years. Some factor of *tree-of-life*, or a subcritical dose of it, might trigger just enough of the change to do that for a hominid. And the Hindmost says Prill's supply was stolen."

Chmeece was nodding. "I remember. One of your asteroid mining craft boarded the abandoned Pak spacecraft. The oldest man in the crew smelled *tree-of-life* and went mad. He ate beyond the capacity of his belly, and died. His crewmates could not restrain him."

"Yah. Now, is it too much to expect that the same thing happened to some UN lab assistant? Prill walks into the UN building carrying a flask of Ringworld longevity drug. The UN wants a sample. A kid barely too young for his first dose of boosterspace—forty, forty-five—opens the flask. He's got the eye dropper all ready. Then he gets a whiff. He drinks it all."

Chmeece's tail lashed air. "I would not go so far as to say that I liked Halroprillalar. Still, she was an ally."

"I liked her."

The hot wind blew around them, filled with dust. Louis felt harried. They wouldn't get another chance to talk in privacy. The probe that relayed signals to and from *Needle* would soon be too high up the Arch for this kind of trick to work.

"Can you think like a Pak for me, Chmeece?"

"I can try."

"They put maps all over the Great Oceans. Instead of mapping Kzin and Down and Mars and Jinx, can you tell me why Pak protectors wouldn't just exterminate the kzinti and Grog and martians and bandersnatchi?"

"Uurr. Why not? Pak would not flinch at exterminating alien species, according to Brennan."

Chmeece paced as he mullied the problem. He said, "Perhaps they expected to be followed. What if they lost a war; what if they expected the winners to come hunting them? To Pak, a dozen burnt-out worlds within a dozen light years of each other might indicate the presence of Pak."

"Mmmm... maybe. Now tell me why they'd build a Ringworld in the first place. How the futz did they expect to defend it?"

"I would not attempt to defend a structure so vulnerable. Perhaps we will learn. I have also wondered why Pak would come to this region of space in the first place. Coincidence?"

"No! Too far."

"Well?"

"Oh... we can guess. Suppose a lot of Pak wanted to run as fast and as far as they could. Again, say they lost a war. Got kicked off the Pak world. Well, there was one safe route out into the galactic arms, and it was mapped. The first expedition, the one that settled Earth, got to Sol system without running into any danger they couldn't handle. They sent back directions. So the losers followed them. Then they set up shop a good safe distance from Sol system."

Chmeece mullied that. Presently he said, "However they came here, the Pak were intelligent and warlike xenophobes. That has implications. The weapon that vaporized half of *Liar*,

the weapon you and Teela persisted in calling a meteor defense, was almost certainly programmed to fire on invading ships. It will fire on *Hot Needle of Inquiry* or the lander, given the chance. My second point is that the Hindmost must not learn who built the Ringworld."

Louis shook his head. "They must be long gone. According to Brennan, a protector's only motivation is to protect his descendants. They wouldn't have let mutations develop. They'd never have let the Ringworld start sliding into the sun."

"Louis—"

"In fact they must have been gone hundreds of thousands of years. Look at the variety of hominids we've found."

"I would say millions of years. They must have departed soon after the first ship sent its help message, and died soon after completing the structure. How else would all of these varieties have had time to develop? But—"

"Chmee, look: suppose they finished the Ringworld a mere half million years ago. Give the breeders a quarter of a million years to spread out, with the protectors fighting now as wars because the territory's virtually unlimited. Then let the protectors die off."

"From what?"

"Insufficient data."

"Accepted. Well?"

"Let the protectors die off a quarter of a million years ago. Give the breeders a tenth the time it took humans to evolve on Earth. A tenth of the time, and a lot of nice gaps in the ecology because the protectors didn't bring anything to prey on the breeders, and a base population in the trillions."

"See? On Earth there were maybe half a million breeders when the protectors died out. On the Ringworld, three million times the room, and plenty of time to spread out before the protectors died. The mutants would have it all their own way."

"I don't accept that you're right," Chmee said quietly. "I do feel that you've missed a point. Granted that the protectors are almost certainly gone. Almost certainly. What if the Hindmost learns that this was their property, their home?"

"Oops. He'd run. With or without us."

"Officially, we have not penetrated the secret of the Ringworld's construction. Agreed?"

"Yah."

"Are we still looking for the Repair Center? The smell of tree-of-life might be deadly to you. You are too old to become a protector."

"I wouldn't want to. Is there a spectroscope in the lander?"

"Yes."

"Tree-of-life doesn't grow right without a soil additive: thalium oxide. Thalium must be more common in the galactic core than it is out here. Wherever the protectors spent a lot of their time, we'll find thalium oxide for the plants. That's how we'll find the Repair Center. We'll go in in pressure suits, if we ever get that far."

THE SCENT OF DEATH

THE HINDMOST'S VOICE exploded at them as they reached the road. "...Lander! Chmee, Louis, what are you hiding? Hindmost calling the land—"

"Stop! Tanj dammit, turn down the volume, you'll blow our ears out!"

"Can you still hear me?"

"We can hear you fine," said Louis. Chmee's ears had folded into pockets of fur. Louis was wishing he could do that. "The mountains must have blocked us."

"And what was it you discussed while we were cut off?"

"Mutiny. We decided against it."

A momentary pause, then, "Very wise," said the Hindmost. "I want your interpretation of this hologram."

One of the screens showed a kind of bracket poking out

from the rim wall. The picture was slightly blurred, and oddly lit: taken in vacuum, in sunlight and light reflected from the Ringworld landscape on the right. The bracket seemed to be of a piece with the rim wall itself, as if *scrith* had been stretched like taffy. The bracket held a pair of washers or droughnuts separated by their own diameter. Nothing else showed save the top of the rim wall. It was impossible to guess the scale.

"This was taken from the probe," the puppeteer said. "I have inserted the probe into the rim transport system, as advised. It is accelerating to antispinward."

"Yah. What do you think, Chmee?"

"It might be a Ringworld attitude jet. It would not be firing, yet."

"Maybe. There are a lot of ways to design a Bussard ramjet. Hindmost, do you get anything in the way of magnetic effects?"

"No, Louis, the machine seems dormant."

"The superconductor plague wouldn't have touched it in vacuum. It doesn't *look* damaged. The controls could be somewhere else, though. On the surface. Maybe they can be repaired."

"You would have to find them first. In the Repair Center?"

"Yah."

The road ran between swampland and stony highlands. They passed what looked like another chemical plant. They must have been seen; there was a deep-throated foghorn sound and a blast of steam from what might have been a chimney. Chmee didn't slow down.

They saw no more of the boxy vehicles.

Louis had seen pale glimmers passing slowly among the trees, far into the swamp. They moved as slowly as mist on water, or as ocean liners docking. Now, far ahead, a white shape moved free of the trees and toward the road.

From a vast white bulk the beast's sense-cluster rose on a slender neck. Its jaw was at ground level; it dropped like a shovel blade, scooping up swamp-water and vegetation as the beast cruised uphill on rippling belly muscles. It was bigger than the biggest dinosaur.

"Bandersnatch," Louis said. What were they doing here? Bandersnatches were native to Jinx. "Slow down, Chmee, it wants to talk to us."

"What of it?"

"They've got long memories."

"What would they remember? Swamp dwellers, muck eaters, without hands to make weapons. No."

"Why not? Maybe they could tell us what bandersnatches are doing on the Ringworld in the first place."

"That is no mystery. The protectors must have stocked their maps in the Great Ocean with samples of the species they considered potentially dangerous."

Chmee was playing dominance games, and Louis didn't like it. "What's the matter with you? We could at least ask!"

The bandersnatch dwindled behind them. Chmee snarled, "You avoid confrontation like a Pierson's puppeteer. Questioning muck-eaters and savages! Killing sunflowers! The Hindmost brought us to this doomed structure against our wills, and you delay our vengeance to kill sunflowers. Will it matter to the Ringworld natives, a year from now, that Louis the God paused in his passing to pull weeds?"

"I'd save them if I could."

"We can do nothing. It is the road builders we want. Too primitive to threaten us, advanced enough to know answers to questions. We will find an isolated vehicle and swoop down on it."

In midafternoon Louis took over the flying.

The swamp became a river that arched away to spinward, wide of its original bed. The crude road followed the new river. The original bed ran more nearly to port, in careful

S-curves, with an occasional rapids or waterfall. It was dry as bone, running into bone-dry desert. The swamp must have been a sea before it silted up.

Louis dithered, then followed the original bed.

"I think we've got the timing right," he told Chmee. "Prill's people evolved long after the Engineers were gone. Of all the intelligent races here, they were the most ambitious. They built the big, grand cities. Then that old plague knocked out most of their machinery. Now we've got the Machine People, and they *could* be the same species. The Machine People built the swamp. They did it after the swamp formed. But I think the swamp formed after the Prill People's empire collapsed.

"So what I'm doing is looking for an old Prill People city. We could get lucky and find an old library or map room."

They had found cities scarce during the first expedition. Today they travelled for some hours without seeing anything except, twice, a cluster of tents, and, once, a sandstorm hiding the size of a continent.

The floating city was still ahead of them, edge on, hiding detail. A score of towers reared around the edge; inverted towers dropped from nearer the center.

The dry river ended in a dry sea. Louis cruised along the shore, twenty miles up. The seabed was strange. It was quite flat, except where artfully spaced islands with fluted edges rose from the bottom.

Chmee called, "Louis! Set us on autopilot!"

"What have you found?"

"A dredge."

Louis joined Chmee at the telescope.

He had taken it for part of one of the bigger islands. It was huge and flat, disk-shaped, the color of seabottom mud. Its top would have been below sea level. Its seamless rim was angled like the blade of a wood planer. The machine had stalled up against the island it had dredged from the seabottom.

So this was how the Ringworld Engineers had kept the sludge flowing into the spillpipes. It wouldn't flow of itself; the seabottoms were too shallow. "The pipe blocked," Louis speculated. "The dredge kept going till it broke down, or till something cut the power... something like the superconductor plague. Shall I call the Hindmost?"

"Yes. Keep him satisfied."

But the Hindmost had bigger news.

"Observe," he said. He ran a quick succession of holograms on one of the screens. A bracket poked up and out from the rim wall, with a pair of toroids mounted at its tip. Another bracket, seen from further away; and in this picture a spill mountain showed at the foot of the rim wall. The spill mountain was half the size of the bracket. A third bracket showed. A fourth, with structures next to it. A fifth—

"Hold it!" Louis cried. "Go back!"

The fifth bracket stayed on the screen for a moment. Its tip held nothing at all. Then the Hindmost flipped back to the fourth hologram.

It was somewhat blurred by the probe's velocity. There was heavy lifting machinery anchored to the rim wall next to the bracket: a crude fusion generator, a powered winch, a drum and a hook floating unsupported below it. The cable depending from the drum must be invisibly thin, Louis thought. It could be shadow square wire.

"A repair team already at work? Uurr. Are they mounting attitude jets or dismounting them? How many are mounted?"

"The probe will tell us," the Hindmost said. "I direct your attention to another problem. Recall to your mind those toroids which circle the waist of the one intact Ringworld spacecraft. We surmise that they generate the electromagnetic scoop fields for Bussard ramjets."

Chmee studied the screen. "The Ringworld ships were all of the same design. I wondered why. You may be right."

Louis said, "I don't understand. What has—"

Two one-eyed snakes looked out of a screen at him. "Halroprillalar's species built part of a transportation system that would give them endless room to colonize and explore. Why didn't they continue? All of the Ringworld was theirs through the rim transport system. Why would they make the effort to reach the stars?"

It made an ugly pattern. Louis didn't want to believe it, but it fitted too well. "They got the motors for free. They dismantled a few of the Ringworld attitude jets and built the ships around them, and reached the stars. And nothing went obviously wrong. So they dismantled a few more. I wonder how many they used."

"The probe will tell us in time," the puppeteer said. "They should have left a few motors still mounted. Why did they not move the Ringworld back into position, before the instability grew so great? Chmee's question is a good one. Are motors being remounted, or stolen to be used in ships so that a few more of Halroprillalar's race may escape?"

Louis's laugh was bitter. "How does this sound? They left a few jets in place. Then came a plague that killed off most of their machinery. Some of them panicked. They took all the ships they had, and they built more ships in a hurry and dismantled most of the attitude jets to do it. They're still at it.



They're leaving the Ringworld to its fate."

Chmee said, "Fools. They did it to themselves."

"Did they? I wonder."

"But this is just the possibility I find ominous," said the puppeteer. "Would they not have taken as much of their civilization as they could move? Certainly they would have taken transmutation machinery."

Oddly, Louis was not even tempted to laugh. But what answer could he make?

The kzin found an answer. "They would take all they could reach. Anything near the spaceport ledges. Anything near the

rim wall, where the rim transport system was available. We must search inward, and we must search out the Repair Center. Any of Prill's people found there would have been trying to save the Ringworld, not leave it."

"Perhaps."

Louis said, "It would help if we knew just when the plague started eating their superconductors."

If he thought the Hindmost would flinch, he was wrong. The puppeteer said, "You will likely learn that before I do."

"I think you know already."

"Call me if you learn anything." The snake heads disappeared.

Chmeece was looking at him strangely, but he said nothing. Louis returned to the flight controls.

The terminator line was a vast shadow encroaching from spinward when Chmeece spotted the city. They had followed a sand-filled riverbed to port of the dry sea. The river was forked here, and the city nestled in the fork.

The Prill People had built tall even where there was no obvious need. The city had not been wide, but it had been tall, until floating buildings smashed down into the lesser structures below. One slender tower still stood, but at a slant. It had driven itself like a spear into the lower levels. A road ran from port, along the outer edge of one branch of the dry river, then across a bridge so massively braced that it had to belong to the Machine People. Halloprillars' people would have used stronger materials, or floated it.

Chmeece said, "The city will have been looted."

"Well, yes, given that someone built a road to do the looting. Why don't you take us down anyway?"

"Your monkey curiosity?"

"Maybe. Just circle the tanj thing, give us a closer look."

Chmeece dropped the lander fast enough to put them in free fall. The kzin's fur was almost grown out, a glossy and handsome orange coat, and a reminder of Chmeece's new youth. Adolescence wasn't helping his temper. Four Man-Kzin Wars, plus a few "incidents"—Louis kept his mouth shut.

The lander surged under them. Louis waited until the savage weight left him, then began adjusting the views through the outside cameras. He saw it almost instantly.

A boxlike vehicle was parked beside the tilted tower. It could have held up to a dozen passengers. The motor housing at its rear should have been enough to lift a spacecraft, but this was a primitive people. He couldn't guess what they'd be using to move the vehicle. He pointed and said, "We find an isolated vehicle and swoop down on it, right?"

"Right." Chmeece let the lander settle. As he did, Louis studied the situation:

The tower had speared down into a squarish building; had smashed through the roof and three stories and possibly into a basement. It was the shell of the lesser building that held it upright. White puffs of steam or smoke jetted irregularly from two tower windows. Pale human shapes were dancing before the lower building's big front entrance—dancing, or holding sprinting contests, and two were resting prone, though in unrestful positions.

Just before the single remaining wall of a collapsed building rose to block Louis's view, it all jumped into his mind's focus. The pale ones were trying to reach the entrance across a rubble-covered street. Someone in the tower was shooting at them.

The lander settled. Chmeece stood and stretched. "You seem to have your own luck, Louis. We can take the ones with the guns to be the Machine People. Our strategy will be to come to their aid."

It seemed reasonable. "Do you know anything about projectile weapons?"

"If we assume chemical propellants, a portable weapon will not penetrate impact armor. We can enter the tower via flying

belts. Carry stunners. We would not want to kill our future allies."

They emerged into full night. Clouds had closed over the sky. Even so, Archlight glowed through in a faint broad band, and the floating city was a tight star-cluster to port. You couldn't get lost.

Louis Wu was not comfortable. The impact armor was too stiff; the hood covered most of his face, the padded straps of the flying belt constricted his breathing, and his feet dangled. But nothing was ever again going to feel like an hour under the wire, and that was that. At least he felt relatively safe.

He hung in the sky and used light-amplified binocular goggles.

The attackers didn't seem that formidable. They were quite naked and weaponless. Their hair was silver; their skin was very white. They were slender and pretty—even the men were more pretty than handsome, and beardless.

They kept to the shadows and the cover provided by fragments of broken buildings, except when one or two would sprint for the great doorway, zigzagging. Louis had counted twenty, eleven of them women. Five more were dead in the street. There might be others already in the building.

The defenders had stopped firing now. Perhaps they had run out of ammunition. They had been using two windows in the downward-slanting face of the tower, perhaps six stories up. Every window in the tower was broken.

He eased close to the larger floating shape of Chmeece. "We go in the other side, with lights at low intensity and wide aperture. I go first because I'm human. Right?"

"Right," said Chmeece.

The belts lifted by scorch repulsion, like the lander. There were small thrusters in back. Louis circled round, checked to see Chmeece following, and floated in one of the windows at what he hoped was the right level.

It was one big room, and it was empty. The smell made him want to sneeze. There was web furniture with the webbing rotted away, and a long glass table, shattered. At the bottom of the sloping floor, a shapeless thing proved to be a pack with shoulder straps. So: they had been here. And the smell—

"Cordite," Chmeece said. "Chemical propulsives. If they shoot at us, cover your eyes." He moved toward a door. He flattened himself against the wall and flung the door suddenly open. A toilet, empty.

A bigger door hung open with the slant of the floor. With stunner in one hand and flashlight-laser in the other, Louis moved toward it. He felt a driving excitement drowning the fear.

Beyond the ornately carved wooden door, a broad circular staircase wound down into darkness. Louis shined his light down along loops of railing, to where the spiral of stairs and the bottom of the building all crumpled in on itself. The light picked out a two-handed weapon with a shoulder butt, and a box that had spilled tiny golden cylinders; another weapon further down; a coat equipped with straps; more scraps of clothing on the lower stair; a human shape crumpled in the crushed bottom of the stairway—a naked man, seeming darker and more muscular than the attackers.

Louis's excitement was growing unbearable. Was this really what he had needed all along? Not the droud and wire, but the risk of his life to prove its value! Louis adjusted his flying belt and dropped over the railing.

He fell slowly. There was nothing human on the stairs, but things had been dropped: anonymous clothing, weapons, boots, another shoulder pack. Louis continued dropping, and suddenly knew he'd found the right level. Quick adjustments to his flying belt sent him slamming though a doorway in pursuit of a smell radically different from what Chmeece had called *cordite*.

He was outside the tower. He barely avoided smashing into a wall; he was still inside the lower, crushed building.

Somehow he'd dropped his light. He flicked up the amplification in the binocular goggles and turned right, toward light.

There was a dead woman in the great doorway: one of the attackers. Blood had pooled beneath a projectile wound in her chest. Louis felt a great sadness for her, and a driving urgency that made him fly right over her, through the doors and out.

The amplified Archlight was bright even through cloud cover. He had found the attackers, and the defenders, too. They were paired off, pale slender forms with shorter, darker ones who still wore bits of clothing, a boot or a head covering or a shirt ripped open. In the fury of their mating they ignored the flying man.

But one was not paired with anyone. As Louis stopped his flight she reached up and grasped his ankle, without insistence and without fear. She was silver-haired and very pale, and her finely chiseled face was beautiful beyond words.

Louis turned off the flying belt and dropped beside her. He took her in his arms. Her hands ran over his strange clothing, questing. Louis dropped the stunner, pulled off his vest and flying belt—his fingers were clumsy—his impact armor, his undersuit. He took her without finesse. His urgency was greater than any consideration for her. But she was as eager as he.

He was not aware of anything but himself and her. Certainly he didn't know that Chmee had joined them. He knew that, joltingly, when the kzin rapped his new love hard across the head with his laser. The furry alien hand sank its claws in her silver hair and pulled her head back, and pulled her teeth loose from Louis Wu's throat.

THE MACHINE PEOPLE



HE WIND BLEW DUST up Louis Wu's nostrils; it whipped his hair in a storm around his face. Louis brushed it back and opened his eyes. The light was blinding-bright. His fumbling hands found a plastic patch on his neck, then binocular goggles covering his face. He pulled them loose.

He rolled away from the woman and sat up.

Now it was dim. Almost dawn: the terminator line split the world into light and dark. Louis ached in every muscle. He felt as if he'd been beaten. Paradoxically, he felt wonderful. For too many years he had used sex only rarely, and only as cover, because wireheads traditionally have no interest in such things. Last night his whole soul had been involved.

The woman? She was about Louis's height, and on the stocky side of pretty. Not flat-chested, not busty, either. Her black hair was bound in a long braid, and there was a disconcerting fringe of beard along her jaw. She slept the sleep of exhaustion, and she'd earned it. They both had. Now he was beginning to remember. But his memories didn't make much sense.

He'd been making love—no, he'd been head over heels in love with the slender pale woman with the red lips. Seeing his blood on her mouth, feeling the sting in his neck, had left him only with a terrible sense of loss. He'd howled when Chmee twisted her head around until her neck snapped. He'd fought when the kzin plucked him off the dead woman. The kzin had tucked him under one arm; he was still raging, still fighting, while Chmee fished the medkit out of Louis's vest and slapped a patch on his neck and tucked the medkit away again.

Then Chmee had killed them, all the pretty silver-haired men and women, spearing them accurately through their heads with the brilliant ruby needle of his flashlight-laser. Louis remembered trying to stop him, and being thrown rolling across the broken pavement. He'd staggered to his feet, and seen someone else moving, and moved toward her. Her, the dark-haired woman, the only defender left alive. They'd moved into each other's arms.

Why had he done that? And Chmee had tried to get his attention... hadn't he? Louis remembered a shrieking as of tigers at war.

"Pheromones," he said. "And they looked so harmless!" He stood up and looked about him in sheer horror. The dead were all around him: the dark ones with wounded necks, the pale ones with blood on their mouths and black char marks in their silver hair.

The guns hadn't been enough. What the vampires had was worse than a tarp. They put out a superstimulus cloud of pheromones, human scent-signals of sexual readiness. One of the vampires, or a pair, must have reached the tower. And the defenders had come out, running, shedding guns and clothing in a haste that sent one over the bannister to his death.

But why, with the vampires dead, had he and the dark-haired woman...?

The wind tossed at Louis's hair. *Yah*. The vampires were dead, but he and the dark-haired woman were still in a cloud of pheromones. They'd mated in frenzy. "If the wind hadn't come up we'd still be Doing It. *Yah*. Now, where the tanj did I leave... everything?"

He found the impact armor and the flying belt. The undersuit was torn to shreds. What about the vest? He saw that the woman's eyes were open. She sat up suddenly, with a horror in her eyes that Louis could well understand. He said to her, "I've got to have the vest because the translator's in it. I hope Chmee doesn't frighten you off before I can—"

Chmee. How had this looked to him?

Chmee's great hand engulfed Louis's skull and twisted it backward. Louis clung to the woman with his body and his mind, and thrust, thrust; but his eyes were filled with that orange beast-face, and his ears with screaming insults. It was distracting...

Chmee wasn't in sight. Louis found the vest a good distance away, gripped in a vampire's dead hand. He couldn't find the stunner. By now he was really worried. Something ugly was thrusting out of his memory. He was running when he reached the place where they'd grounded the lander.

A chunk of rock too big for three men to lift was holding down a generous pile of black superconductor cloth. Chmee's parting gift. The lander was gone.

I'll have to get over this sooner or later, Louis thought. *Why not now?* A friend had taught him this cantrip, this bit of magic for recovering from shock or grief. Sometimes it worked.

He was sitting on what had been a porch railing, though the porch now sat alone in a sand-covered walkway. He had donned his impact armor and the vest with all the pockets. He had put clothing between himself and a vast and lonely world. Not modesty, but fear.

That had used up all his ambition. Now he sat. Thoughts drifted aimlessly. He thought of a working droud as far away as the Earth from its moon, and a two-headed ally who would not risk landing here even to save Louis Wu. He thought of the Ringworld Engineers and their idealized ecology, which had included nothing like mosquitos or vampire bats; and his lips quirked into the beginning of a smile, then settled into a dead man's expression, which is no expression at all.

He knew where Chmee had gone. He smiled again to think how little good it did him. Had Chmee told him that? No matter. Survival, or the mating urge, or vengeance on the Hindmost, would all drive Chmee in the same direction. But would any of these motives bring him back to rescue Louis Wu?

And he thought how little one death mattered, with the Ringworld's trillions all doomed to intimate contact with their sun.

Well, Chmee might return. Louis ought to get off his butt and do something about reaching the floating city. They'd

been headed there; Chmee would expect to find him there, if some whim brought the kzin back for the ally who had failed him so badly. Or Louis might actually learn something valuable. Or—he'd have to survive somewhere in the year or two left to him. *I'll have to get over this sometime. Why not now?*

Somebody yelled.

The black-haired woman had dressed herself in shorts and shirt and a backpack. She held a projectile weapon at her side, pointed at Louis Wu. With her other arm she gestured and yelled again.

Vacation was over. Louis became acutely aware that his hood was around his neck. If she tried a head shot... well, she might just give him time to pull the hood over his face, and then it wouldn't matter if she fired or not. The impact suit would stop the projectiles while he ran. What he really needed was the flying belt. Or did he?

"Okay," said Louis, and he smiled and raised his hands to the sides. What he really needed was an ally. With one hand he reached slowly into his vest, withdrew the translator, clipped it just under his throat. "This will talk for us, as soon as it learns to."

She motions with the gun: *Go ahead of me.*

Louis walked as far as the flying belt, stooped and picked it up, without jerky motions. Thunder cracked. A stone six inches from Louis Wu's foot jumped wildly away. He dropped the harness and stepped back.

Tanj, she wasn't talking! She'd decided he couldn't speak her language, and that was that. How would the translator learn anything?

With his hands in the air, he watched her fiddle one-handed with the flying belt while she kept the gun more or less on him. If she touched the wrong controls he'd lose the belt and the cloth, too. But she set the belt down, studied Louis's face a moment, then stepped back and gestured.

Louis picked up the flying belt. When she gestured toward her vehicle, he shook his head. He went to where Chmee had left an acre or so of superconductor cloth, weighed down by a boulder far too heavy to move.

The gun never left him as he strapped the harness around the rock and activated the flying belt. He wrapped his arms around the rock—and the harness, for fear it would slip—and lifted. The rock came up. He turned full around and let go. It settled slowly to the ground.

Was that respect in her eyes? Was it for his technology, or his strength? He turned off the belt, picked up both it and the superconductor cloth, and moved ahead of her to her vehicle. She opened double doors in its side. He set his burden down and looked around.

Couches around three sides; a tiny stove in the center, and a hatch in the roof for a smokehole. Stacks of baggage behind the rear seat. Another couch in front, facing forward.

He backed out. He turned back toward the tower, took one step forward and looked at her. She got the idea. She dithered, then gestured him on.

The dead were beginning to smell. He wondered if she would bury or burn them. But she walked among the bodies without stopping. It was Louis who stopped, to probe with his fingers in a woman's silver hair.

There was too much hair, too little skull. Beautiful she was, but her brain was smaller than a human brain. He sighed and went on.

The woman followed him through the shell of the lower building, into the tower's spiral staircase, and down. A dead man of her species lay broken in the crushed basement, and the flashlight-laser was next to him. When he glanced back at the woman he saw tears in her eyes.

He reached for the flashlight-laser and she fired past him. The ricochet thumped him on the hip, and he shied violently inside the suddenly rigid shell. He backed against the

shattered wall while she picked up the device.

She found the switch, and light jumped around them in a wide beam. She found the focus; the beam narrowed. She nodded and dropped the device in her pocket.

On their walk back to the vehicle Louis casually pulled the impact suit hood over his face, as if the sunlight were too bright. She might have all she wanted from Louis Wu; or she might be short of water; or she might not want his company.

She didn't shoot him. She climbed into the car and locked the doors, with a key. For an instant Louis saw himself marooned with no water and no tools. But she gestured him close to the right-hand window, where the driving controls were. She began to show him how to drive.

It was the breakthrough Louis had hoped for. He repeated the words she called through the window, and added his own words. "Steering ring. Turn. Activator. Key. Throttle. Retro-throttle." She was pretty good with gestures. A hand zipping through air plus a finger tracing a needle's path were "airspeed gauge."

It startled her when the translator began talking back to her. She let the language lesson continue for a bit. Then she unlocked the door, backed across the seat with the gun ready, and said, "Get in. Drive."

The machine was noisy and balky. It translated every little bump directly to the driver's couch, until Louis learned to steer around cracks in the road, rubble, or drifts of sand. The woman watched him silently. Did she have no curiosity? It occurred to him that she had lost a dozen companions to the vampires. Under the circumstances she was functioning well enough.

Presently she said, "I am Valavirgillin."

"I am Louis Wu."

"Your devices are strange. The speaker, the lifter, the variable light—what more have you?"

"Tanj dammit! I left the eye pieces."

She pulled the binocular goggles out of a pocket. "I found these."

She may have found the stunner, too. Louis didn't ask. "Good. Put them on and I'll show you how they work."

She smiled and shook her head. She must be afraid he'd jump her. She asked, "What were you doing in the old city? Where did you find these things?"

"They are mine. I brought them from a far star."

"Do not mock me, Louis Wu."

Louis looked at her. "Did the people who built the cities have such things?"

"They had things that speak. They could raise buildings in the air; why not themselves?"

"What of my companion? Have you found *his* like on the Ringworld?"

"He seemed monstrous." She flushed. "I had no chance to study him."

No, she'd been distracted. Nuts. "Why do you point a gun at me? The desert is enemy to both of us. We should help each other."

"I have no reason to trust you. Now I wonder if you are mad. Only the City Builders travelled between the stars."

"You are mistaken."

She shrugged. "Must you drive so slowly?"

"I need practice."

But Louis was getting the hang of it. The road was straight and not too rough, and there was nothing coming at him. There were drifts of sand across the road. Valavirgillin had told him not to slow for these.

And he was moving toward his destination, at a fair clip. He asked, "What can you tell me about the floating city?"

"I have never been there. The children of the City Builders use it. They no longer build, nor do they rule, but our custom is that they keep the city. They have many visitors."

"Tourists? People who go only to see the city?"

She smiled. "For that and other reasons. One must be invited. Why must you know these things?"

"I have to get to the floating city. How far may I drive with you?"

Now she laughed. "I think that you will not be invited there. You are not famous nor powerful."

"I'll think of something."

"I go as far as the school at River's Return. There I must tell them what happened."

"What *did* happen? What were you doing there in the desert?"

She told him. It wasn't easy. There were gaps in the translator's vocabulary. They worked around the gaps and filled them in.

The Machine People ruled a mighty empire.

Traditionally, an empire is a cluster of nearly independent kingdoms. They must pay taxes, and they follow the emperor's commands as regards war, banditry control, maintenance of communication, and sometimes an official religion. Otherwise they follow their own customs.

And that was doubly true within the Machine Empire, where, for instance, the way of life of a herd-keeping carnivore was competitive to the Grass People, useful to the traders who bought their tooled leather goods, and irrelevant to the ghouls. In some territories many species worked in cooperation, and all allowed free passage to the ghouls. The various species followed their own customs because they were built to.

Ghoul was Louis Wu's word. Valavirgillin called them something like *Night People*. They were the garbage collectors and the morticians, too; which was why Valavirgillin had not buried her dead. The ghouls had speech. They could be taught to give Last Rites in the local hominid religions. They formed an information source for the Machine People. Legend said that they had done the same for the City Builders, when they ruled.

According to Valavirgillin, the Machine Empire was an empire of trade, and it taxed only its own merchants. The more she talked, the more exceptions Louis found. The kingdoms maintained the roads that linked the empire, if they were capable of it, which (for instance) the tree-living Hanging People were not. The roads marked the borders between territories held by different species of hominid. Wars of conquest across the roads were forbidden; and so the roads prevented wars (sometimes!) merely by existing.

The empire had the power to draft armies to battle bandits and thieves. The large patches of land the empire took for trading posts tended to become full colonies. Because roads and vehicles linked the empire, the kingdoms thereof were required to distill chemical fuel and hold it available. The Empire purchased mines (by forced sale?), mined its own ore, and leased the right to manufacture machinery to the Empire's specifications.

There were schools for traders. Valavirgillin and her companions were students and a teacher, from the school at River's Return. They had set out on a field trip to a trade center bordering the jungle lands of the Hanging People—brachiators, Louis gathered, who traded in nuts and dried fruit—and the Herders, carnivores who dealt in leather goods and handicrafts. (No, they were not small and red. A different species.) They had veered for a side trip to an ancient desert city.

They had not expected vampires. Where would vampires find water in this desert? Who would they get there? Vampires were almost extinct, except for—

"Except for what? I missed something."

Valavirgillin blushed. "Some older people keep toothless vampires for... for purpose of *rishathra*. That may be how it happened. A tame pair escaped somehow, or a pregnant female."

"Vala, that's disgusting."

"It is," she agreed coolly. "I never heard anyone admit to keeping vampires himself. Where you come from, is there nothing that some do that others find shameful?"

That shot struck home. "I'll tell you about current addiction sometime. Not now."

She studied him over the metal snout of her weapon. Despite that fringe of black beard along her jaw, she looked human enough—but widened. Her face was almost perfectly square. Louis was having trouble reading her face. That was predictable enough; the human face has evolved as a



Alex Stevens

signalling device, and Vala's evolution diverged from his.

He asked, "What will you do next?"

"I must report the deaths, and give over the artifacts from the desert city. There is a bounty, but the empire claims city-builder artifacts."

"I tell you again that they are mine."

"Drive."

The desert was showing patches of greenery, and a shadow square sliced the sun, when Valavirgillin bade him stop. He was glad to. He was exhausted with the battering of the road and the endless task of keeping the vehicle aimed.

Vala said, "You will—dinner."

They were used to gaps in the translation. "I missed that word."

"You contrive to heat food until it can be eaten. Louis, can't you—?"

"Cook." She wasn't likely to have frictionless pans and a microwave oven, was she? Or measuring cups, refined sugar, butter, any spice he could recognize—"No."

"I will cook. Make me a fire. What do you eat?"

"Meat, some plants, fruit, eggs, fish. Fruit I can eat not cooked."

"Just like my people, except for fish. Good. Step out and wait."

She locked him out of the vehicle, then crawled into the back. Louis stretched aching muscles. The sun was a blazing sliver, still dangerous to look at; but the desert was growing dark. A broad band of worldscape blazed to antispinward. There was brownish scrub grass around him now, and a clump of tall, dry trees. One tree was white and dead-looking.

She crawled out into the air. She tossed a heavy thing at Louis's feet. "Cut wood and build a fire."

Louis picked it up: a length of wood with a wedge of crude

burning. Louis strolled over and kicked the logs into a tighter pile around the stump. He played the laser into their midst and watched the fire catch.

Something thumped him between the shoulder blades. For an instant the impact suit went stiff. He heard a single crack of thunder.

Louis waited for a bit, but the second shot didn't come. He turned and walked back to the vehicle and Vala. He said to her, "Don't you ever, ever do that again."

She looked pale and frightened. "No. I won't."

"Shall I help you carry your cooking things?"



iron fixed to one end. "I hate to sound stupid, but what is it?"

She named it. "You swing the sharp edge against the trunk till the tree falls down. See?"

"Ax." Louis remembered the war axes in the museum on Kzin. He looked at the ax, then the dead tree—and suddenly he'd had enough. He said, "It's getting dark."

"Do you have trouble seeing at night? Here." She tossed him the flashlight-laser.

"That dead tree good enough?"

She turned, giving him a nice profile, the gun turning with her. Louis adjusted the light to narrow beam, high intensity. He flipped it on. A bright thread of light licked past her. Louis flicked it across her weapon. The weapon spurted flame and fell apart.

She stood there with her mouth open and the two pieces in her hands.

"I am perfectly willing to take suggestions from a friend and ally," he told her. "I'm sick of taking orders. I got plenty of that from my furry companion. Let's be friends."

She dropped what she was holding and raised her hands.

"You've got more bullets and more guns in the back of the vehicle. Arm yourself." Louis turned away. He sliced his beam down the dead tree in zigzag fashion. A dozen logs fell

"No, I can... Did I miss you?"

"No."

"Then how?"

"One of my tools saved me. I brought it a thousand times the distance light travels in a *fan*, and it's *mine*."

She made a kind of arm-flapping gesture and turned away.

STRATEGIES OF TRADE

THERE WAS A PLANT THAT GREW along the ground like so many links of green-and-yellow-striped sausage, with rootlets sprouting between the links. Valavirgillin sliced some of these into a pot. She added water, then some seed pods from a sack in the vehicle. She set the pot on the burning logs.

Tanj, Louis could have done that himself. Dinner was going to be crude.

The sun was entirely gone now. A tight cluster of stars to port must be the floating city. The Arch swooped up the black sky in horizontal bands of glowing blue and white. Louis felt that he was on some tremendous toy.

"I wish I had some meat," Vala said.

Louis said, "Give me the goggles."

He turned away from the fire before he put the goggles on. He turned up the light amplification. The pairs of eyes that had been watching from beyond the reach of the firelight resolved. Louis was glad he hadn't fired at random. Two large shapes and a smaller one were a family of ghouls.

But one bright-eyed shadow was small and furry. Louis snipped it headless with the long bright thread from his flashlight-laser. The ghouls flinched. They whispered among themselves. The female started toward the dead animal, but stopped to give Louis precedence. Louis picked up the body and watched her back away.

The ghouls seemed diffident enough. But their place in the ecology was very secure. Vala had told him what happened when a people went to the great effort of burying or burning their dead. The ghouls attacked the living. They owned the night. With magic gleaned from scores of local religions, they were said to be able to turn invisible. Even Vala half-believed it.

But they weren't bothering Louis. Why would they? Louis would eat the furry beast, and one day Louis himself would die, and the ghouls would claim their due.

While they watched him, he examined the creature: rabbitlike, but with a long flat-ended tail and no forepaws at all. Not a hominid. Good.

When he looked up, there was a faintly glowing violet flame far to port.

Holding his breath, holding himself very still, Louis raised both the light-amplification and the magnification. Even his pulse in his temples was blurring the picture now, but he knew what he saw. The magnified flame was eye-hurting violet, and it fanned out like a rocket firing in vacuum. Its bottom was clipped off by a straight black line: the edge of the portward rim wall.

He lifted the goggles. Even after his eyes adjusted the violet flame was barely visible, but it was still there, tenuous—and tremendous.

Louis returned to the fire and dropped the beast at Vala's feet. He walked into the darkness to starboard and donned the goggles again.

The flame to starboard showed much larger; but of course that rim wall was much closer.

Vala skinned the little furry beast and dropped it into the pot without removing the entrails. When she had finished, Louis led her by the arm into the darkness. "Wait a little, then tell me if you see a blue flame far away."

"Yes, I see it."

"Do you know what it is?"

"No, but I think my father does. There was something he wouldn't talk about, the last time he came back from the city. There are more. Turn your eyes to the base of the Arch to spinward."

A daylight blue-and-white horizontal strip was bright enough to make him squint. Louis covered it with the edge of his hand; and then, with the goggles to help, he could make out two small candle flames on the rims of the Arch, and two above them, tinier yet.

Valavirgillin said, "The first appeared seven *falans* ago, near the base of the spinward Arch. Then more to spinward, and these large flames to port and starboard, then more small ones on the antispinward Arch. Now there are twenty-one. They only show for two days each turn, when the sun is brightest."

Louis heaved a gusty sigh.

"Louis, I don't know what it means when you do that. Are you angry or frightened or relieved?"

"I don't know either. Let's say relieved. We've got more time than I thought."

"Time for what?"

Louis laughed. "Haven't you had enough of my madness yet?"

She bridled. "After all, I can choose whether to believe you

or not!"

Louis got mad. He didn't hate Valavirgillin; but she was a thorny character, and she had already tried to kill him once. "Fine. If this ring-shaped structure you live on is left to itself, it will brush against the shadow squares—the objects that cover the sun when night comes—in five or six *falans*. That will kill everything. There won't be anything left alive when you brush against the sun itself—"

She screamed, "And you sigh with relief?"

"Easy, take it easy. The Ringworld is *not* being left alone. Those flames are motors for moving it. We're almost at the closest point to the sun, and they're using braking thrust...they're firing inward, sunward. Like this." She sketched the situation for her in the dirt with a pointed stick. "See? They're holding us back."

"You say now that we will not die?"

"The motors may not be strong enough for that. But they'll hold us back. We could have ten or fifteen *falans*."

"I do hope you are mad, Louis. You know too much. You know that the world is a ring, and that is secret." She shrugged as one shifts a heavy weight. "Yes, I have had enough of it. Will you tell me why you have not suggested *rishathra*?"

He was surprised. "I would have thought you'd had enough of *rishathra* to last a lifetime."

"That is not funny. *Rishathra* is the way to seal a truce!"

"Oh. All right. Back to the fire?"

"Of course, we need light."

She pulled the pot a little back from the flame, to cook more slowly. "We must discuss terms. Will you agree not to harm me?" She sat down across from him on the ground.

"I agree not to harm you unless attacked."

"I make you the same concession. What else do you want from me?"

She was brisk and matter-of-fact, and Louis fell into the spirit of the thing. "You will transport me as far as you can, subject to your own needs. I expect that's as far as... ah... River's Return. You will treat the artifacts as mine. You will not turn them or me over to any authority. You will give me advice, to the best of your knowledge and ability, that will get me into the floating city."

"What can you offer in return?"

Here now, wasn't this woman utterly at Louis Wu's mercy? Well, never mind. "I will attempt to find out if I can save the Ringworld," he said, and was somewhat astonished to realize that it was what he most desired. "If I can, I will no matter what the cost. If I decide the Ringworld can't be saved, I will try to save myself, and you if it's convenient."

She stood. "A promise empty of meaning. You offer me your madness as if it held real value!"

"Vala, haven't you dealt with madmen before?" Louis was amused.

"I have never dealt with even sane aliens! I am only a student!"

"Calm down. What else can I offer you? Knowledge? I'll share my knowledge freely, such as it is. I know how the City Builders' machines failed, and who caused it." It seemed safe to assume that the City Builders were Halrioprilalar's species.

"More madness?"

"You'll have to decide that for yourself. And... I can give you my flying belt and eye pieces when I'm through with them—"

"When is *that* likely to be?"

"When and if my companion returns." The lander held another flying belt and set of goggles, intended for Halrioprilalar. "Or let them be yours when I die. And I can give you half my store of cloth now. Strips of it would let you repair some of the City Builders' old machines."

Vala thought it over. "I wish I were more skilled. Well, then, I agree to all of your requirements."

"I agree to yours."

She began to take off her clothes and jewelry. Slowly, titillatingly, until Louis saw what she was doing: stripping herself of all possible weapons. He waited until she was quite naked, then imitated her, dropping the flashlight-laser and goggles and the pieces of impact armor some distance from her, adding even his chronometer.

They made love, then, but it wasn't love. The madness of last night was gone with the vampires. She asked his preferred technique, then insisted, and he chose the missionary position. It was too much a formality. Perhaps it was meant to be. Afterward, when she went to stir the cooking pot, he was careful that she didn't get between him and his weapons. It felt like that kind of situation.

She came back to him, and he explained that his kind could make love more than once.

He sat cross-legged with Vala in his lap, her legs closed tight around his hips. They stroked each other, aroused each other, learned each other. She liked hiving her back scratched. Her back was muscular, her torso wider than his own. A strip of her hair ran all the way down her spine. She had fine control of the muscles of her vagina. The fringe of beard was very soft, very fine.

And Louis Wu had a plastic disk under the hair at the crown of his head.

They lay in each other's arms, and she waited.

"Even if you don't have electricity, you must know about it," Louis said. "The City Builders used it to run their machines."

"Yes. We can make electricity from the flow of a river. Tales tell that endless electricity came from the sky, before the fall of the City Builders."

Which was accurate enough. There were solar power generators on the shadow squares, and they beamed the power to collectors on the Ringworld. Naturally the collectors used superconducting cables, and naturally they had failed.

"Well, then. If I let a very fine wire run down into my brain in the right place—which I did—then a very little bit of electric power will tickle the nerves that register pleasure."

"What is it like?"

"Like getting drunk without the hangover or the dizziness. Like *rishathra*, or real mating, without needing to love anyone but yourself, and without needing to stop. But I stopped."

"Why?"

"An alien had my electric source. He wanted to give me orders. But I was ashamed before that."

"The City Builders never had wires in their skulls. We would have found them when we searched the ruined cities. Where is this custom practiced?" she asked. Then she rolled away from him and stared at him in horror.

It was the sin he regretted most often: not keeping his mouth shut. He said, "I'm sorry."

"You said strips of that cloth would—*What is that cloth?*"

"It conducts electric current and magnetic fields with no loss. Superconductor, we call it."

"Yes, that was what failed the City Builders. The... superconductor rotted. Your cloth will rot, too, will it not? How long?"

"No. It's a different kind."

She screamed it at him. "*How do you know that, Louis Wu?*"

"The Hindmost told me. The Hindmost is an alien who brought us here against our will. He left us with no way home."

"This Hindmost, he took you as slaves?"

"He tried to. Humans and *kzinti*, we make poor slaves."

"Is his word good?"

Louis grimaced. "No. And he took the superconductor cloth and wire when he fled his world. He didn't have time to make it. He must have known where it was, in storage. Like the other things he brought, the stepping disks: it must have

been readily available."

And he knew instantly that something was wrong, but it took him a moment to know what it was.

The translator had stopped speaking too soon.

Then it spoke with a very different voice. "Louis, is it wise to tell her these things?"

"She guessed part of it," Louis said. "She was about to blame me for the Fall of the Cities. Give me back my translator."

"Can I allow you this ugly suspicion? Why would my people perform so malicious an act?"

"Suspicion? You son of a bitch." Vala knelt watching him with big eyes, listening to him talk to himself in gibberish. She couldn't hear the Hindmost's voice in his earphones. Louis said, "They kicked you out as Hindmost and you ran. You grabbed what you could and ran. Stepping disks and superconductor cloth and wire and a ship. Disks were easy. You must make them by the million. But where would you find superconductor cloth just waiting for you? And you *knew* it wouldn't rot on the Ringworld!"

"Louis, why would we do such a thing?"

"Trade advantage. Give me back my translator!"

Valavirgilin got up. She pulled the pot a little out from the fire, stirred it, tasted. She disappeared toward the vehicle and returned with two wooden bowls, which she filled with a dipper.

Louis waited uneasily. The Hindmost could leave him stranded, with no translator. Louis wasn't good with languages.

"All right, Louis. It wasn't planned this way, and it happened before my time. We were searching for a way to expand our territory with minimal risk. The Outsiders sold us the location of the Ringworld."

The Outsiders were cold, fragile beings who roamed throughout the galaxy in slower-than-light craft. They traded in knowledge. They might well have known of the Ringworld, and sold the information to puppeteers, but... "Wait a minute. Puppeteers are afraid of spacelight."

"I overcame that fear. If the Ringworld had proved suitable, then one spacelight in an individual's lifetime is no great risk. We would have flown in stasis, of course. From what the Outsiders told us, and from what we learned via telescopes and automatic probes, the Ringworld seemed ideal. We had to investigate."

"An Experimentalist faction?"

"Of course. Still, we hesitated to contact so powerful a civilization. But we analyzed Ringworld superconductors through laser spectroscopy. We made a bacterium that could feed on it. Probes seeded the superconductor plague across the Ringworld. You guessed as much?"

"That much, yah."

"We were to follow with trading ships. Our traders would come opportunely to the rescue. They would learn all we needed to know, and gain allies, too." Clear and musical, the puppeteer's voice held no trace of guilt, or even embarrassment.

Vala set the bowls down and knelt across from him. Her face was in shadow. From her viewpoint the translation could not have ended at a worse moment.

Louis said, "Then the Conservatives won an election, I take it."

"Inevitable. A probe found attitude jets. We knew of the Ringworld's instability, of course, but we hoped for some more sophisticated means of dealing with it. When the pictures were made public, the government fell. We have had no chance to return to the Ringworld until—"

"When? When did you spread the plague?"

"Eleven hundred and forty years ago by Earth time. The Conservatives ruled for six hundred years. Then the threat of the *kzinti* put Experimentalists back in power. When the time seemed opportune I sent Nessus and his team to the

Ringworld. If the structure had survived for eleven hundred years after the fall of the culture that kept it in repair, it would have been worth investigating. I could have sent a trade and rescue team. Unfortunately—"

Valavirgillin had the flashlight-laser in her lap, pointed at Louis Wu.

"—unfortunately the structure was damaged. You found meteor holes, and landscape eroded down to the *scrith*. It now seems—"

"This is an emergency. This is an emergency." Louis held his voice steady. How had she *done* that? He'd watched her kneel with a steaming bowl of stew in each hand. Could the thing have been taped to her back? Skip it. At least she hadn't fired yet.

"I hear you," said the Hindmost.

"Can you turn off the flashlight-lasers by remote control?"

"I can do better than that. I can explode it, killing him who holds it."

"Can't you just turn it off?"

"No."

"Then give me back my translator function tanj quick. Testing—"

The box spoke Machine People speech. Vala answered immediately. "Who or what were you talking to?"

"To the Hindmost, the being who brought me here. May I assume that I have not yet been attacked?"

She hesitated before answering. "Yes."

"Then our agreements are still in force, and I'm still gathering data with intent to save the world. Do you have reason to doubt that?" The night was warm, but Louis felt very naked.

The dead eye of the flashlight-laser remained dead. Vala asked, "Did the Hindmost's race cause the Fall of the Cities?"

"Yes."

"Break off negotiation," Vala ordered.

"He's got most of our data-gathering instruments."

Vala thought it through, and Louis remained still. Two pairs of eyes glowed close behind her in the dark. Louis wondered how much the ghouls heard with those goblin ears, and how much they understood.

"Use him, then. But I want to hear what he says," said Vala. "I have not even heard his voice. He may be only your imagination."

"Hindmost, you heard?"

"I did." Louis's earplugs were speaking Interworld, but the box at his throat spoke Valavirgillin's own tongue. Well and good. "I heard your promise to the woman. If you can find a way to stabilize this structure, do so."

"Sure, your people could use the room."

"If you should stabilize the Ringworld with the help from my equipment, I want credit. I may want to ask a reward."

Valavirgillin snarled and choked off a reply. Louis said quickly, "You'll get the credit you deserve."

"It was my government, under my leadership, that tried to bring aid to the Ringworld eleven hundred years after the damage was done. You will vouch for that."

"I will, with reservations." Louis was speaking for Vala's benefit. He told her, "By our agreements, you regard what you're holding as my property."

She flipped him the flashlight-laser. He set it aside, and felt himself sagging with relief, or fatigue, or hunger. *No time*. "Hindmost, tell us about the attitude jets."

"Bussard ramjets mounted on brackets on the rim wall, regularly spaced, three million miles apart. We should find two hundred mountings on each rim wall. In operation each would collect the solar wind over a four to five thousand mile radius, compress it electromagnetically until it undergoes fusion, and blast it back in rocket fashion, in braking mode."

"We can see some of them firing. Vala says there are... twenty-one operating?" Vala nodded. "That's ninety-five

percent of them missing. Futz."

"It seems likely. I have holos of forty mountings since we last spoke, and all were empty. Shall I compute the thrust delivered with all jets firing?"

"Good."

"I expect there are not enough jets mounted to save the structure."

"Yah."

"Would the Ringworld engineers have installed an independently operating stabilizing system?"

Pak protectors didn't think that way, did they? They tended to have too much confidence in their ability to improvise.

"Not likely, but we'll keep looking. Hindmost, I'm hungry and sleepy."

"Is there more that must be said?"

"Keep a watch on the attitude jets. See what's functional and get their thrust."

"I will."

"Try to contact the floating city. Tell—"

"Louis, I can send no message through the rim wall."

"Of course not, it was pure *scrith*. Move the ship."

"It would not be safe."

"What about the probe?"

"The orbiting probe is too distant to send on random frequencies." With vast reluctance the Hindmost added, "I can send messages via the remaining probe. I should send it over the rim wall in any case, to refuel."

"Yah. First set it on the rim wall for a relay station. Try to reach the floating city."

"Louis, I had trouble homing on your translator. I trace the lander nearly twenty-five degrees to antispinward of your position. Why?"

"Chmeee and I split our efforts. I'm headed for the floating city. He's for the Great Ocean." It should be safe to say that much.

"Chmeee doesn't answer my broadcasts."

"Kzinti make poor slaves. Hindmost, I'm tired. Call me in twelve hours."

Louis took up his bowl and ate. Valavirgillin had used nothing in the way of spices. The boiled meat and roots didn't excite his taste buds. He didn't care. He licked the bowl clean, and retained just enough sense to take an allergy pill. They crawled into the vehicle to sleep.

THE MOVING SUN



HE PADDED BENCH WAS A POOR substitute for sleeping plates, and it was jolting under him. Louis was still tired. He slept and was shaken awake, slept and was shaken awake—

But this time it was Valavirgillin shaking his shoulders. Her voice was silkily sarcastic. "Your servant dares to break your well-earned rest, Louis."

"Uh. Okay. Why?"

"We have come a good distance, but here there are bandits of the Runner breed. One of us must ride as gunner."

"Do Machine People eat after waking?"

She was disconcerted. "There is nothing to eat. I am sorry. We eat one meal, then sleep."

Louis donned impact armor and vest. Together he and Vala manhandled a metal cover into place over the stove. Louis stood on it and found that his head and armpits rose through the smokehole. He called down, "What do Runners look like?"

"Longer legs than mine, big chests, long fingers. They may carry guns stolen from us."

The vehicles lurched into motion.

They were driving through mountainous country, through dry scrub vegetation, chaparral. The Arch was visible by daylight, if you remembered to look; otherwise it faded into the blue of the sky. In the haze of distance Louis could make

out a city floating on air in fairy-tale fashion.

It all looked so real, he thought. Two or three years from now it might as well have been some madman's daydream.

He fished the translator out of his vest. "Calling the Hindmost. Calling the Hindmost—"

"Here, Louis. Your voice holds an odd tremor."

"Bumpy ride. Any news for me?"

"Chmee still does not answer calls, nor do the citizens of the floating city. I have landed the second probe in a small sea, without incident. I doubt that anyone will discover it on a sea bottom. In a few days *Hot Needle of Inquiry* will have full tanks."

Louis declined to tell the Hindmost about the Sea People. The safer the puppeteer felt, the less likely he was to abandon his project, the Ringworld, and his passengers. "I meant to ask. You've got stepping disks on the probes. If you sent a probe for me, I could just step through to *Needle*. Right?"

"No, Louis. Those stepping disks connect only to *Needle's* fuel tank, through a filter that passes only deuterium atoms."

"If you took off the filter, would they pass a man?"

"You would still end in the fuel tank. Why do you ask? At best you might save Chmee a week of travel."

"That could be worth doing. Something might come up." Now, why was Louis Wu hiding the rogue *kzin's* defection? Louis had to admit that he found the incident embarrassing. He really didn't want to talk about it, and it might make a puppeteer nervous. "See if you can work out an emergency procedure, just in case we need it."

"I will, Louis. I locate the lander a day short of reaching the Great Ocean. What does Chmee expect to find there?"

"Signs and wonders. Things new and different. Tanj, he wouldn't have to go if we knew what was there."

"But of course," the puppeteer said skeptically. He clicked off, and Louis pocketed the translator. He was grinning. What did Chmee expect to find at the Great Ocean? Love and an army! If the map of Jinx had been stocked with bandersnatches, then what of the map of *Kzin*?

Sex urge or self-defense or vengeance, any of these would have driven Chmee to the map of *Kzin*. For Chmee, safety and vengeance went together. Unless Chmee could dominate the Hindmost, how could he return to known space?

But even with an army of *kzinti*, what would Chmee expect to do against the Hindmost? Did he think they'd have spacecraft? Louis thought he was in for a disappointment.

But there would certainly be female *kzinti*.

There was something Chmee could do about the Hindmost. But Chmee probably wouldn't think of it, and Louis couldn't tell him now. He wasn't sure he wanted to, yet. It was too drastic.

Louis frowned. The puppeteer's skeptical tone was worrying. How much has he guessed? The alien was a superb linguist; but because he was alien, such nuances would never creep into his voice. They had to be *put* there.

Time would tell. Meanwhile, the dwarf forest had grown thick enough to hide crouching men. Louis kept his eyes moving, searching clumps and folds of hillside ahead. His impact armor would stop a sniper's bullet; but what if a bandit shot at the driver? Louis could be trapped in mangled metal and burning fuel.

He kept his full attention on the landscape.

And presently he saw that it was beautiful. Straight trunks five feet tall sprouted enormous blossoms at their tips. Louis watched a tremendous bird settle into a blossom, a bird like a great eagle but for the long, slender spear of a beak. Elbow root, a larger breed than he'd seen on his first visit, ninety million miles from here, grew in a tangle of randomly placed fences. Here grew the sausage plant they'd eaten last night. There, a sudden cloud of butterflies, very like Earth's butterflies at this distance.

It all looked so real. Pak protectors wouldn't build anything flimsy, would they? But the Pak had had vast faith in their

Larry Niven

works, and in their ability to repair *anything*, or even to create new widgets from scratch.

And all of his speculation was based on the word of a man seven hundred years dead: Jack Brennan the Belter, who had known the Pak only through one individual. The tree-of-life had turned Brennan himself into a protector-stage human—armored skin, second heart, expanded braincase and all. That might have left him insane. Or Phssthpok might have been atypical. And Louis Wu, armed with Jack Brennan's opinions on Phssthpok the Pak, was trying to think like something admittedly more intelligent than himself.

But there *had* to be a way to save all this.

Chaparral gave way to sausage plant plantations to spinward, rolling hills to antispinward. Presently Louis saw his first refueling station ahead. It was a major operation, a chemical factory with the beginnings of a town growing around it.

Vala called him down from his perch.

She said, "Close the smokehole. Stay in the van and do not be seen."

"Am I illegal?"

"You are uncouth. There are exceptions, but I would need to explain why you are my passenger. I have no good explanation."

They pulled up along the windowless wall of the factory. Through the window Louis watched Vala dickering with long-legged, big-chested people. The women were impressive, with large mammaries on large chests, but Louis wouldn't have called them beautiful. Their long, dark hair covered their foreheads and cheeks, enclosing tiny T-shaped faces.

Louis crouched behind the front seat while Vala stowed packages through the passenger's door. Presently they were moving again.

An hour later, far from any habitation, Vala pulled off the road. Louis climbed down from his gunner's perch. He was ravenous. Vala had bought food: a large smoked bird, and nectar from the giant blossoms. Louis tore into the bird. Presently he asked, "You're not eating?"

Vala smiled. "Not till night. But I will drink with you."

She took the colored glass bottle around to the back of the vehicle and ran clear fluid into the nectar. She drank, then passed the bottle. Louis drank.

Alcohol, of course. You couldn't have oil wells on the Ringworld, could you? But you could build alcohol distilleries anywhere there were plants for fermenting. "Vala, don't some of the...ah...subject races get to like this stuff too much?"

"Sometimes."

"What do you do about it?"

The question surprised her. "They learn. Some become useless from drinking. They supervise each other if they must."

It was the wirehead problem in miniature, with the same solution: time and natural selection. It didn't seem to bother Vala, and Louis couldn't afford to let it bother him. He asked, "How far is it to the city?"

"Three or four hours to the air road, but we would be stopped there. Louis, I have given thought to your problem. Why can't you just fly up?"

"You tell me. I'm for it, if nobody shoots at me. What do you think, would somebody shoot at a flying man, or would they let him talk?"

She slipped from the bottle of fuel and nectar. "The rules are strict. None but the City Builder species may come unless invited. But none have flown to the city, either!"

She passed him the bottle. The nectar was sweet: like watered grenadine syrup, with a terrific kick from what must be 200-proof alcohol. He set it down and turned his goggles on the city.

It was vertical towers in a lily-pad-shaped clump, in a jarring variety of styles: blocks, needles tapered at top and bottom, translucent slabs, polyhedral cylinders, a slender cone moored tip down. Some buildings were all window; some were all balconies. Gracefully looping bridges or broad straight ramps linked them at unpredictable levels. Granted that the builders weren't quite human; Louis still couldn't believe that anyone would build such a thing on purpose. It was grotesque.

"They must have come from thousands of miles around," he said. "When the power stopped, there were buildings with independent power supplies. They all got together. The Prill People mushed them all up into one city. That's what happened, isn't it?"

"Nobody knows. But, Louis, you speak as if you watched it happen!"

"You've lived with it all your life. You don't see it the way I do." He kept looking.

There was a bridge. From a low, windowless building at the top of a nearby hill, it rose in a graceful curve to touch the bottom of a huge fluted pillar. A poured stone road switchbacked uphill to the hilltop building.

"I take it the invited guests have to go through that place at the top, then up the floating bridge."

"Of course."

"What happens in there?"

"They are searched for forbidden objects. They are questioned. If the City Builders are choosy about whom they let up, why, so are we! Dissidents have sometimes tried to smuggle bombs up. Mercenaries hired by the City Builders once tried to send them parts to repair their magic water collectors."

"What?"

Vala smiled. "Some still work. They collect water from the air. Not enough water. We pump water to the city from the river. If we argue over policy, they go thirsty, and we do without the information they gather, until compromise is reached."

"Information? What have they got, telescopes?"

"My father told me about it once. They have a room that shows what happens in the world, better than your goggles. After all, Louis, they have height and a view."

"I should be asking your father all this. How—"

"That may not be a good idea. He is very...he does not see..."

"I'm the wrong shape and color?"

"Yes, he would not believe you can make things like the things you own. He would take them."

Tanj dammit. "What happens after they let the tourists

through?"

"My father comes home with his left arm inscribed in a language only the City Builders know. The script gleams like silver wire. It does not wash off, but it fades in a *falan* or two."

That sounded less like a tattoo than like printed circuitry. The City Builders might have more control over their guests than their guests knew. "Okay. What do the guests do up there?"

"They discuss policy. They make gifts: large quantities of food and some tools. The City Builders show them wonders and do *rishathra* with them." Vala stood suddenly. "We should be moving."

They had left the threat of bandits behind. Louis rode in front, beside Vala. Noise was as much a problem as the bumping; they had to raise their voices. Louis shouted, "*Rishathra*?"

"Not now, I'm driving." Vala showed a wide expanse of teeth. "The City Builders are very good at *rishathra*. They can deal with almost any race. It helped them hold their ancient empire. We use *rishathra* for trading and for not having children until we want to mate and settle down, but the City Builders never give it up."

"Do you know anyone who could get me invited up as a guest? Say, because of my machines."

"Only my father. He wouldn't."

"Then I'll have to fly up. Okay, what's under the city? Can I just stroll underneath and float up?"

"Underneath is the shadow farm. You might pass for a farmer, if you leave your tools behind. The farmers are of all races. It is a dirty job. The city sewer outlet is above, and sewage must be spread for the plants. The plants are all cave life that grows in darkness."

"But...oh, sure, I see it now. The sun never moves, so it's always dark under the city. Cave life, huh? Mushrooms?"

She was staring at him. "Louis, how can you expect the sun to move?"

"I forgot where I was." He grimaced. "Sorry."

"How can the sun move?"

"Well, of course it's the planet that moves. Our worlds are spinning balls, right? If you live on one point, the sun seems to go up one side of the sky and down the other, then there's night till it rises again. Why did you think the Ringworld Engineers put up the shadow squares?"

The car began to weave. Vala was shaking, her face pale. Gently Louis asked, "Too much strangeness for you?"

"Not that." She made an odd barking sound. Agonized laughter? "The shadow squares. Obvious to the stupidest of people. The shadow squares mock the day and night cycle for spherical worlds. Louis, I really hoped you were mad. Louis, what can we do?"

He had to give her some kind of answer. He said, "I thought of punching a hole under one of the Great Oceans, just before it reaches the point closest to the sun. Let several Earth-masses of water spew into space. The reaction would push the Ringworld back where it belongs. Hindmost, are you listening?"

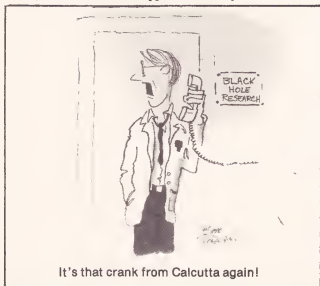
The too-perfect contralto said, "It does not seem feasible."

"Of course it's not feasible. For one thing, how would we plug the hole afterward? For another, the Ringworld would wobble. A wobble that big would probably kill everything on the Ringworld, and lose the atmosphere, too. But I'm trying. Vala, I'm trying."

She made that odd barking sound and shook her head hard. "At least you do not think too small!"

"What would the Ringworld engineers have done? What if some enemy shot away most of the attitude jets? They wouldn't have built the Ringworld without planning for something like this. I need to know more about them. Get me into the floating city, Vala!"

[To Be Continued]



The Aleph

Andrew A. Whyte



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BUTLER, Octavia E.
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Title in manuscript: "To Keep Thee In All Thy Ways"
Announced previous as "Dana".



CARD, Orson Scott
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And the Devil Will Drag You Under
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Doctor Who and the Revenge of the Cybermen
[Doctor Who series, no.6]
Adapted from the script of the same name by Gerry Davis.
Both books: Pinnacle/June/\$1.75
Both books published first in UK by W.H. Allen.

DISCH, Thomas M.
On Wings of Song
Fantasy & Science Fiction/February-April
St. Martin's Press/August/\$10.00

DRAKE, David (F)
The Dragon Lord
Berkley-Putnam/August/\$9.95

ELGIN, Suzette Haden
Star-Anchored, Star-Angered
[Coyote Jones series]
Doubleday/June/\$7.95

ELLISON, Harlan (O)
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Afterword by Robert Thurston
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Cormac Fitzgerald stories.

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JENKINS, Harry
An Affair of Survival
Vantage Press/May/\$5.95

For the sake of brevity and convenience, certain abbreviations have been supplied as a reference code. They will be found on the right-hand side. Here is a key: (C) Collection (more than one story by the same author); (C+) Story series collected or collection with unifying theme; (F) Fantasy; (J) Juvenile; (O) Omnibus (Collection containing at least one novel). Since SF novels make up the majority of books listed, none of these are specified as such. We have recently added new symbols to deal with the increasing amount of illustrated fiction: (GN) Graphic Novel; (GS) Graphic Story; and (GC) Graphic Collection—are used to denote books of which approximately equivalent portions are shared between text and artwork.

ABBEY, Lynn (F)
Daughter of the Bright Moon
Illustrations by Stephen Fabian
Sunridge Press (dist. by Grosset & Dunlop)/July/\$6.95

ADAMS, Robert
A Cat of Silvery Hue
[Horseclans series, No.4]
NAL Signet/August/\$1.75

AKERS, Alan Burt
see PRESCOT

ANNAN, Ralph
The Spider-Men: A Science Fantasy Adventure
Illustrations by Ken Landgraf
Vantage/April/\$5.95
Vanity press item.

ANTHONY, Piers (F)
Castle Roogna
[Xanth Trilogy: III]
Ballantine-delRey/July/\$1.95

BAILEY, Gerald Earl (F)
Sword of Poyana
[The Saga of Thorgrim: Book Two]
Berkley/August/\$1.75

BARBA, Thomas
The Day the World Went Sane
Harian Creative Press/June/\$7.95 & \$3.95
(47 Hyde Boulevard/Ballston Spa NY 12020)

JETER, K.W.
Merlock Night
DAW/June/\$1.75
First announced as "The Morlocks Are Coming."

KILLOUGH, Lee
The Doppelgänger Gambit
Ballantine-deRuy/July/\$1.95

KILWORTH, Garry
In Solitary
Avon/July/\$1.75
First publication in UK (1977) by Faber & Faber.

KING, Stephen
The Dead Zone
Viking/August/\$11.95

KIRK, Russell (C)(F)
The Princess of All Lands
Arkham House/June/\$8.95

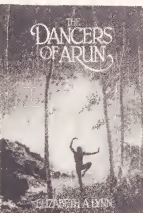
KROPP, Lloyd
One Hundred Times To China
Doubleday/August/\$10.00

LEE, Tanith
Electric Forest
DAW/August/\$1.75
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LONG, Frank Belknap (C)
Night Fear
Edited by Roy Torgeson
Introduction by Torgeson & Alan Ryan
Zebra/June/\$1.95

LORD, Jeffrey
Gladstons of Hapanu
Richard Blade series, No. 311
Pinnacle/July/\$1.50

LUKEMAN, Tim (F)
Rajan
Doubleday/July/\$7.95



LYNN, Elizabeth A. (F)
The Dancers of Arun
[The Chronicles of Tarnor: II]
Berkely-Putnam/July/\$10.95

McINTOSH, J.T.
A Planet Called Utopia
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and LONG, Doug
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POURNELLE, Jerry
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Illustrations by Bermejo
Ace Special/June/\$6.95

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The Drawing of the Dark
Ballantine-deRuy/June/\$1.95

PRESCOTT, Dray
(As told to Alan Burt Akers)
A Sword for Kregen
[Prescott series, No. 20]
[Jikaida Cycle: II]
DAW/August/\$1.75

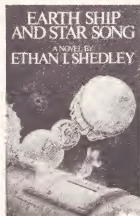
ROBESON, Kenneth
The Hate Genius
[Doc Savage series, No. 94]
Bantam/June/\$1.75

The Red Spider
[Doc Savage series, No. 95]
Afterword by Will Murray
Bantam/July/\$1.75
First time in print.

RUSHDIE, Salman
Grinus
Ologor Press (dist. by Viking)/
August/\$10.00
First publication in UK (1975) by
Gollancz.

RUSKIN, Ronald
The Last Panic
Bantam/July/\$2.25
Title in manuscript: "The Djerba
Stone."

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Ace/June/\$1.95



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Earth Ship and Star Song
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Maturity: Three Stories
Edited by Scott Imes & Stuart W.
Wells III
Complete Sturgeon bibliography by
Dennis Lien & Jayne Sturgeon.
Illustrated by James R. Odbert
Rune Press (Minnesota Science Fiction
Society)/April/\$12.50
Edition limited to 750 copies.

TATE, Peter
Greencomber
Doubleday/August/\$7.95

THOMPSON, Donald
The Ancient Enemy
Fawcett Gold Medal/August/\$1.75

TUBB, E.C.
Web of Sand
[Dumarest of Terra series, No. 20]
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VANCE, Jack (F)
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[Cugel the Clever series]
Illustrated by Stephen Fabian
Underwood-Miller/May/\$5.95

The Seventeen Virgins (F)
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VESS, Charles (GC)
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VIGLIANTE, Mary (F)
The Colony
[The Aftermath: Book One]
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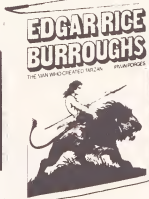
The Land
[The Aftermath: Book Two]
Manor/August/\$1.75

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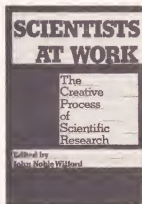
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Reviews

Floyd Kemske



SCIENTISTS AT WORK
edited by John Noble Wilford
Dodd, Mead, \$9.95

Reviewed by Hal Clement

T HIS IS a book for: Scientists who regard Humanism as anti-intellectual; Humanists who consider Science inhuman;

Sportsmen who think science is boring;

Nature-worshippers who believe science to be dangerous;

Science fiction fans who duck real science as stodgy;

Writers who think they know all about their profession; and just about everybody else.

In other words, I think very highly of it. This is a collection of articles by the *New York Times* science staff, which appeared in that paper between mid-1975 and early 1978. The writers are reporters, professionals in the highest sense. Their aim was to present briefly, clearly, and adequately some event or other which might be of importance, or at least of interest, to a reasonable fraction of *Times* readers.

Some of these readers could be

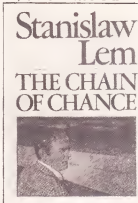
expected to know a good deal about the subject already; the writers were expected not to bore them. Some would have little or no relevant knowledge; these should not be confused. Some would have prejudices conflicting with the new information; these, if at all possible, should at least not be offended or irritated. Until I read this book I had not realized the skill required to do this sort of writing. I had read newspaper science reports, of course, but never on such a wide variety of subjects in such a short time.

There is of course no perfect middle ground where all of the above groups can be satisfied. I would have been happier with more detailed information in Victor McElheny's piece on the Ferreed Crosspoint telephone switch, and would have been satisfied with less in Walter Sullivan's description of galactic observation at Kitt Peak. However, if either writer had been aiming at me, personally, he would have done less than his job demanded.

The book includes fields ranging from the whole cosmos to subatomic particles. Subjects of investigation range from the crudely utilitarian—the search for a male contraceptive and the possibility of predicting earthquakes—to abstractions which our shallower thinkers would dismiss as a waste of money, such as cosmology or the shape of a molecule.

I would list this as required reading for someone who wants to write science fiction but doesn't have enough basic knowledge to guide his search for ideas, and also for the reader who wants a mystery fan's chance of guessing what a particular science fiction writer is leading up to.

For others, who might regard it as required, it's still a lot of fun.



THE CHAIN OF CHANCE
by Stanislaw Lem
translated by Louis Iribarne
Harcourt, Brace, Jovanovich, \$7.95

Reviewed by Lisa Tuttle

...a completely new type of crime, a crime that's not only unmotivated but

also indiscriminate, in the same way that scattering nails all over the road is an indiscriminate crime. (p. 89)

A SERIES of deaths in Italy puzzle investigators. Are they related by chance, or something more sinister? Are they the result of crime or accident? Although each death is different (one person drowns, another hangs himself, another is a victim of a hit-and-run accident, still another apparently suffocates in his sleep), each was preceded by a bout of extreme paranoia, in which the victim went in fear of a plot to kill him. A closer examination reveals even more similarities: all the victims were men, foreigners who frequented a health spa's mineral baths, all suffered either hay fever or asthma, all were men of a similar build and between the ages of 40 and 60.

At first glance, Lem's novel is a mystery. But it's a metaphysical mystery, because it questions the very nature of reality and natural laws. Like his previous novel, *The Investigation*, *The Chain of Chance* takes the form of the traditional detective story, but the substance of unique, wonder-evoking science fiction.

The narrator is an American private detective, a former astronaut, who has been hired to go to Italy and retrace the last steps of one of the victims, a man called Adams. The detective is the same age and physical type as Adams and, like Adams and the previous victims, also suffers from hay fever. By re-living the last days of Adams' life is he tempting fate, or some mysterious conspiracy? Can there be a solution to this mystery, or are the events only a vast and meaningless string of coincidence?

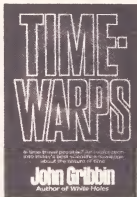
The story is set in the near future, and the reader becomes aware that it is not the present through the narrator's casual remarks on the commonplaces of his day—a passing reflection about a new "feminist underground," and a description of the intense, fool-proof security measures in the Rome airport, for example. Lem constructs this world, as well as the mystery, with a masterful skill.

Not only the setting makes *The Chain of Chance* science fiction: the theme and the ideas behind the suspenseful plot define it.

Science fiction, after all, is not limited to such sciences as biology, physics or astronomy. *The Chain of Chance* takes on probability theory, causality and coincidence. Ultimately it questions the very thesis of the detective story by suggesting that finding the solution to a mystery may be the result of a vast, random pattern, a series of chances that cannot be planned or predicted.

But chance could be another word for fate. In the book, Lem has one character suggest that "Mankind has multiplied to such an extent that it's now starting to be governed by atomic laws. The movement of gas atoms is chaotic, but out of this chaos are born such things as stable pressure, temperature, specific gravity and so on. Your accidental success looks like a long series of extraordinary coincidences. But it only seems that way to you."

Lem takes science fiction into new realms of imagination and intellect. *The Chain of Chance* is an exciting, thoughtful, fascinating book.



TIMEWARPS

by John Gribbin

Delacorte/Eleanor Friede, \$8.95

Reviewed by Floyd Kemske

IF YOU are afraid your sense of wonder has not been getting much use lately, you should take a look at the market's current nonfiction. Some of it is pretty fantastic, capable of pulling you out of your skin and inflaming your imagination.

If you are a habitual reader of science fiction, you might enjoy seeing some of your favorite imaginative notions receiving systematic examination in a book called *Timewarps*. John Gribbin is an astronomer and a science writer who thinks a lot of unusual phenomena can be explained by adopting a new notion of time. Time as an ever-flowing, one-way stream is a convention of Western thinking, he claims, and might not be adequate any longer. He does not advance a specific theory of what time is (if it's not an ever-flowing stream), but tries to wake the reader up to the different possibilities. It is a book of explorations and one of those reading experiences which will at least set your mind racing if it doesn't change your whole outlook on life.

Don't be put off by the first one or two chapters, which predictably describe the history of humanity's view of time, biological clocks, time zones, calendars, and a lot of other things you might

already know about. Even before he reaches his actual speculative chapters, however, he assesses the possibilities of time travel as they are already known—the theoretical use of black holes and the relativistic squeeze. The "time travel" known to be possible right now is all one-way into the future.

Beyond the classical Western notions of time, however, there is a whole new realm of possibilities based on parallel universes (didn't I tell you we would get to some of your favorite imaginative notions?). Precognition, dreams, telepathy, and human memories of previous lives can be explained by the tendency of the mind to shuttle back and forth among various timestreams. In a closing section which is bound to drive up sales of *I Ching* all over the country, Gribbin speculates on the mechanism responsible for the uncanny accuracy of the predictions and advice users associate with the *Book of Changes*.

Timewarps is a comfortable way to expand your horizons. Nothing in it is advanced with the stridency often shown by apostles of the paranormal. It is simply the work of an organized, imaginative mind.

ENGINE SUMMER

John Crowley



ENGINE SUMMER

by John Crowley

Doubleday, \$7.95

Reviewed by Kate Eldred

SCIENCE FICTION, like any other genre, has gone through changes in preoccupation, from alien invasions to quasi-medieval quests. In the Fifties, a lot of us scared ourselves to sleep with books about the survivors of the Last Holocaust, ordinary people who were trying to salvage the remnants of civilization to start afresh. Crowley has taken that theme and updated it with a grace and wit that might start a whole new genre all by itself.

The path to universal destruction is no longer solely military; there's such a breathlessly long list of scenarios

[continued on page 95]

Best Sellers

Compiled as of July 1, 1979

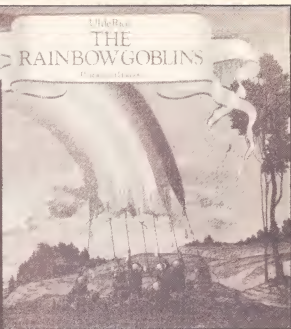
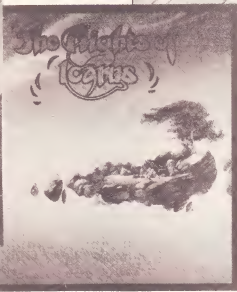
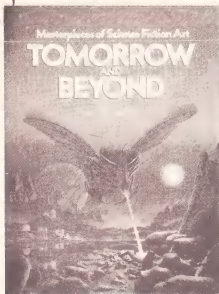
HARDCOVER

- Jem**
Frederik Pohl: St. Martin's
- Drumdrums**
Anne McCaffrey: Atheneum
- Harpist in the Wind**
Patricia McKillip: Atheneum
- The Jesus Incident**
Frank Herbert & Bill Ransom: Berkley-Putnam
- The White Dragon**
Anne McCaffrey: Ballantine
- The Lovers**
Philip Jose Farmer: delRey
- Fountains of Paradise**
Arthur C. Clarke: Harcourt Brace

PAPERBACKS

- The White Dragon**
Anne McCaffrey: delRey
- Alien**
Alan Dean Foster: Warner
- Hot Sleep**
Orson Scott Card: Ace
- God of Tarot**
Piers Anthony: Jove
- Retief Unbound**
Keith Laumer: Ace
- Legacy**
James H. Schmitz: Ace
- The Earthbook of Stormgate**
Poul Anderson: Berkley

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Entertainment

David Gerrold

THE PUBLISHERS of coffee-table books have finally discovered science fiction. In the past year, several large-size collections of SF art, well-printed on heavy stock, have appeared. And it's about time, too.

In fact, it's probably long overdue. There are just too many fine artists working in the field who have not yet received the attention and recognition that they have earned.

Two of the better recent collections are *Tomorrow and Beyond*, and *The Flights of Icarus*.

Tomorrow and Beyond, edited by Ian Summers, and published by Workman Publishing, is a diverse and often exciting collection. There are 128 pages of color reproductions, more than 300 different illustrations in all; 65 different artists are represented. A wide range of artists, styles and visual interpretations are offered here, perhaps too wide; the effect is one of haphazard gathering according to theme without regard for "best."

To be sure, with this many artists and paintings represented, it would be difficult to avoid a scattershot feeling in the selection, and certainly Summers has demonstrated just how far-ranging the scope of SF illustration can be, but

there are stinkers in this collection and it's a pity because there is also so much of value. (For instance, I could have done without another look at Ray Feibush's "Deathbeast" illustration, which is probably an imitation of a recent Frazetta illo, in favor of a real Frazetta painting.) As a survey, however, of some of the best works of some very good commercial artists, this book has more than enough gems to justify its price.

Some of my favorites include Michael Whelan's illustration for H. Beam Piper's *Little Fuzzy*, two of John Schoenherr's excellent paintings based on Frank Herbert's *Dune*, Rowena Morrill's spookily tender cover for Theodore Sturgeon's *The Dreaming Jewels* (also published as *The Synthetic Man*) and another that she did for Robert Shaw's *Nightwalk*, Boris Vallejo's captivating interpretation of Larry Niven's *Flight of the Unicorn*, three of Ron Miller's alien landscapes that are nothing less than breathtaking in their photographic realism and their sense of place (this man paints like he's been there!), and a host of smaller works by too many other artists to mention here.

The book includes a valuable appendix identifying every work and its source material, plus a listing of

individual artists and the pages on which each one's work can be found. In sum, it is a worthwhile collection of some of the better commercial SF illustration done in recent years. It's a "should-have" for serious fans.

More serious in approach is *The Flights of Icarus* by Donald Lehmkuhl, edited by Martyn Dean and Roger Dean, and perhaps for that reason it is a more profound and successful collection. There is a strong sense of editorial unity here, a feeling that all thirty-two of the artists represented are working in similar philosophical veins as opposed to the diverse ones of *Tomorrow and Beyond*.

The Flights of Icarus is divided into thematic sections, each tracing a facet of life's progress toward godhood and completion. The moments are titled: Fall and Flight, Leviathan, Legend, Xanadu, Nowhere, Time, Space, and Oracles. Each moment is preceded with an almost poetic set of observations that twang in the memory like something uttered by Lazarus Long, but with a ring of spiritual truth as if the author were unveiling some of the laws of nature for us in the most precise and beautiful language possible. The paintings in each moment are presented as evocations of the moment's theme, and they are equally as profound and stunning as the narrative.

The editors, Martyn Dean and Roger Dean, have demonstrated a respect for their task that borders on the reverent. The graphics here, the context in which the material is presented, the great care taken to maintain a feeling of unity, make this not only a quality collection, but one to treasure for a long time to come. These are paintings that transcend their commercial origins (and perhaps some day scholars will do learned treatises on the SF school of

art); and none of them are given less than a half page (unlike *Tomorrow and Beyond* which occasionally and unfortunately chocks as many as nine paintings onto a single page). Amazingly, there is not a stinker in the whole collection. And if I were to list the paintings here that I like, I would end up listing more than 100 different works. There are glorious landscapes, dinosaurs, cities, spaceships, barbarians, dragons, UFOs, and hardware galore. This is a "must-have" book on every level.

The artists' names and biographies are listed in the front of the book, along with the titles of their included works and the pages on which they can be found. Bravo to all involved.

From Octopus Books in London comes *The Encyclopedia of Science Fiction*, a lush volume, profusely illustrated and filled with a good deal of valuable information. At \$16.95, it is almost worth the price. Unfortunately, editor Robert Holdstock has allowed personal opinion to masquerade as fact in several articles and this weakens the integrity of a work that purports to be an "encyclopedia." A shame really, because there is so much of quality here.

It is still a noble effort, however, with excellent graphics, lists, and charts; it surveys a good deal of esoterica, and as a collection of minutiae it's probably one of the best source books available. There is a distinctly British flavor here—which is only to be expected, of course, this being a British publication—but that tone of voice may also put off some American readers, especially the flatly judgmental statements in some of the articles.

The book is broken into sections, each one written by a different author; there are discussions of Major Themes, Pulp and Magazines, Screen Trips, Machine as Hero, Alien Encounter, Art and Artists, Fiction to Fact, Outer Limits, New Wave, and Yesterday, Today and Tomorrow.

The problem is that this book takes itself far too seriously. Despite the sumptuous packaging, one is ultimately left with the disturbing feeling that the fun has been left out, the "sense of wonder" that drew the audience to science fiction in the first place.

And I take issue with some of the conclusions drawn by contributing writers. The piece on "new wave" for instance, will probably be old news to those most likely to purchase this book, and one can only wonder why the issue is being rehearsed here at such length. Most of the arguments about "old wave" versus "new wave" (and various attempts to classify individual authors by those same elusive definitions) ultimately proved to be more sound and fury than substance and, if anything, the controversy only proved that there are a myriad of waves, each only one writer thick.

The "Yesterday, Today and Tomorrow" section is an exercise in poor judgment; some of Malcolm Edwards' opinions seem like nothing more than thinly-disguised personal attacks—especially his predictions as to who are going to be major talents in the future and who can be safely forgotten. To gauge any writer's overall worth by his/her earliest efforts is *prejudice*, in its truest definition of "pre-judgment." The result is to ignore one individual's

capacity for artistic growth while being blinded by another's early-peak technical proficiency before the real returns have come in. Staying power must be part of the judgment, too. Malcolm Edwards ought to have his wrists slapped—with an anvil.

Also worthy of special mention is *UI de Rico's The Rainbow Goblins*, which appeared in the bookstores just before Christmas. Ostensibly an oversized children's book, at \$25 a copy, this is no casual gift.

Rico has written a simple fable, a fantasy about seven goblins who dream of capturing the rainbow to eat its colors, but are foiled by the flowers who eavesdrop on their plans. He has illustrated this story with twelve full-sized paintings, two double-sized spreads, and three half-page paintings, and placed it all between two of the most beautiful covers ever published.

The paintings are big, they are colorful, and they are lush. Rico's landscapes evoke eighteenth century panoramas. They are classical in proportion and scope, yet fanciful and baroque in their detail. He also demonstrates a flair for near-psychedelic imagery in several explosions of light and color, as well as in the book's end-papers. In one night-scape, he even evokes a tranquil blue luminescence that reminds one of the best of Maxfield Parrish. It is easily one of the most handsome and impressive packages in a long time. One Los Angeles area fan has described it as "a book to look at stoned—but without the dope." Only he's wrong. It's better than that.

—G—

The Aleph

[continued from page 85]

WALLING, William

The World I Left Behind Me
St. Martin's Press/June/\$8.95

WALTER, Elizabeth (C)(F)
In the Mist and Other Uncanny Encounters

Frontispiece by Stephen Fabian
Arkham House/June/\$8.95

WARNER, R.D.
Gauche Rift
Manor/August/\$1.75

WHITE, Mary Alice
The Land of the Possible
Warner/August/\$2.25

WILHELM, Kate
Juniper Time
Harper & Row/June/\$10.95
SF Book Club alternate/Fall/\$4.98+

WOLF, Gary K.
The Ressurrectionist
Doubleday/July/\$7.95

WOLFMAN, Mary [adaptor]
Doomsday
[The Fantastic Four series, No. 1]
Pocket Books/July/\$1.95
Based on a Marvel Comics episode.

ZINOVIEV, Alexander
The Yawning Heights
Translated from the Russian by Gordon Clough
Random House/June/\$15.00

ANTHOLOGIES

ALDISS, Brian W. [editor]
Evil Earths
Avon/August/\$2.50
First publication in UK (1977) by Futura (Orbit Books)

ASIMOV, Isaac
GREENBERG, Martin Harry [editors]
Isaac Asimov Presents the Great Science Fictions: Volume Two (1940)
DAW/August/\$2.25

ASIMOV, Isaac
GREENBERG, Martin Harry
WAUGH, Charles G. [editors]
The Science Fictional Solar System
Harper & Row/August/\$11.95

BAEN, James [editor]
Destinies: Volume One, Number Four
Ace/August/\$2.25

BRETNOR, Reginald [editor]
Thor's Hammer: The Future at War
(Volume One)
Ace/August/\$2.25

CARR, Terry [editor]
Beyond Reality: Eight Stories of Science Fiction
Elsevier-Nelson/June/\$8.95

The Year's Finest Fantasy: Volume 2
Berkley-Putnam/July/\$9.95 & \$1.95

The Best Science Fiction of the Year #8
Ballantine-del Rey/July/\$2.25
SF Book Club (Nelson Doubleday)/August/\$3.50+

FRENKEL, James [editor]
Binary Star #3
Dell/August/\$1.95
Contains "Outerworld" by Isidore Haiblum and "Dr. Scofflaw" by Ron Goulart.

GREENBERG, Martin Harry
OLANDER, Joseph D.
WAUGH, Charles G.
Mysterious Visions: Great Science Fiction by Masters of the Mystery
Foreword by Isaac Asimov
St. Martin's Press/June/\$12.95

MALZBERG, Barry N.
PRONZINI, Bill [editors]
The End of Summer: Science Fiction of the Fifties
Analog Books #10 (Dist. by Ace)
Ace/June/\$1.95
Baronet/October/\$4.95

PAGE, Gerald W. [editor]
The Year's Best Horror Stories: Series VII
DAW/July/\$1.95

RABKIN, Eric S. [editor]
Fantastic Worlds: Myths, Tales and Stories
Oxford University Press/May/\$15.95 & \$5.95

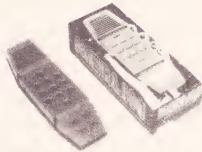
SCHIFF, Stuart (F)
Whispers Two
Illustrated by Tim Kirk
Doubleday/August/\$7.95

SILVERBERG, Robert
GREENBERG, Martin Harry
OLANDER, Joseph D. [editors]
Car Sinister
Avon/August/\$2.25

—G—

Games

Marvin Kaye



DIGITS

Coleco Industries

CODE NAME: SECTOR

MERLIN

Parker Brothers

REMEMBER Ray Bradbury's electronic grandmother? Well, the day of its/her practicality is almost upon us. In fact, I wish I had one now to rescue me from the clutches of a non-Arthurian wizard yclept *Merlin* who hath me in thrall, mesmerizing me with his eleven glowing crimson eyes!

I do not exaggerate. Ever since the review sample of Parker Brothers' handheld electronic games console, *Merlin*, arrived, I've been spending far too much time playing with this incredibly addictive product. My will power is sapped; often the only thing that frees me is when my daughter beats me to *Merlin*.

Merlin and all the other new play-against-a-computer games are probably making a profound change in the play pattern of many American children. It is a prime tenet of child psychology that no toy is as valuable as the company of another child. Games usually encourage this, since they traditionally require two or more youngsters to compete against each other. But the sophistication of existing electronic games (and the increased complexity of Christmas 1979 games just viewed by me at the American Toy Fair) is able to provide often rather personable playmates that can be "invited" to play just by flicking

a button. A review column is not the place to explore the ramifications of the phenomenon, but its foreshadowing potential ought to be at least noted.

Parker's *Merlin* is a wildly popular, TV-promoted product that deserves the best-seller status it now enjoys in the game industry. A handheld, battery-operated (six AAs) item roughly the shape and weight of a new telephone handset, *Merlin* has six activities programmed into it: Tic Tac Toe (and the computer wins more than you'd think likely); Music Machine; Echo; Blackjack 13 (my personal favorite: object is to win by staying under or at 13; the computer starts you with five "chips" in the form of blinking lights and you can go up to a jackpot ten lights or down to zero—when you bust); Magic Square (a puzzle), and Mindbender. A total of four games—five if Magic Square is modified into a competitive activity.

The player flips on *Merlin*'s switch, then presses a pressure-sensitive window to indicate which game is desired; there are six, so any of six windows may be pressed. Echo, a game of optionally increasing difficulty, involves the computer playing a melody of tones from one through nine. The sequence sounds rapidly, and the player must press the correct windows to repeat the sequence. A failure results in a baleful buzz and the number of errors lights up. In Magic Square, each window controls different lights that turn on or off; by pressing the correct sequence, a square of lights will flash on—a bit like those old checkerboard puzzles in several pieces, except that with *Merlin*, the pieces are shown one at a time when summoned by a button-press.

Merlin contains extra buttons for repeating the current game or changing games, as well as a "Hit Me" button for Blackjack 13. Music Machine, though not a game, is fascinating and delightful and possibly a way to compose science fictional music for your next Trekkie gabfest. *Merlin*, in its Music Machine cycle, may be programmed with up to 48 synthesizer-ish tones (and rests), and will play it back as often as desired. (By transferring the melody to a tape recorder, one can create a whole Baroque composition, one stage at a time. Excellent for the theme-and-variations form.)

The final *Merlin* game, Mindbender, is one of inductive logic, attempting to discover a secret number code the computer has selected. This is the sole *Merlin* activity not up to the general quality level. The secret code idea has become quite popular since the introduction a few years ago of *Master Mind*. (Details will be discussed in a later *Galileo* games column.) To play a game of inductive logic involving numbers, it

is helpful to have access to a digital readout of guesses. This *Merlin* cannot provide; thus Mindbender is a little difficult to play well. Paper and pencil are required to complement it.

Nevertheless, the inclusion of this inductive contest adds an extra feature to an already superb product and cannot, therefore, be altogether discounted. Quite simply, *Merlin* is the best electronic game item I've seen to date, and its modest price underscores the recommendation. (It is at a suggested list of perhaps \$25. If you see it for less, snap it up as a bargain. If you see it for a lot more, shop around...\$40 is too steep.)

A game which does provide a readout while solving a numerical *Master Mind*-ish code is Coleco's attractive game, *Digits*.



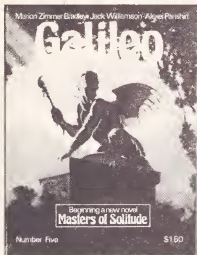
In *Digits*, the computer selects a four-number code, using digits up to nine and zero, depending on the skill level the player chooses. The player punches buttons corresponding to numbers he wants to try; his selections appear in order on a readout screen. Once his code attempt is entered, a "try" button is pressed, and on an adjacent screen, the computer reports the player's status by showing how many digits he guessed and whether they are in the right or wrong position in the four possible locations in the code. There is a "Give Up" button, in case the code breaker wants to capitulate.

It is unlikely that an adult player would give up, though; the code is always breakable by pure rote system. This play scenario really only has depth of meaning when the number of attempts are limited on the part of each player. Coleco includes tally sheets to do just that, since the computer does not keep track of the tries. (Neither does *Merlin*.)

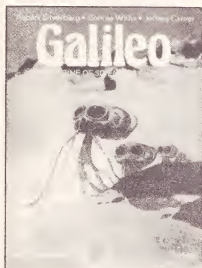
It is a subtle difference, but somehow I find those inductive logic games more challenging that permit the codemaking to be done by the opponent, rather than a machine. Nevertheless, *Digits* is attractive, lightweight and very popular with children. It is probably best suited as a gift for a bright youngster.

Digits utilizes a nine-volt battery, or it may be operated by a variety of battery eliminators.

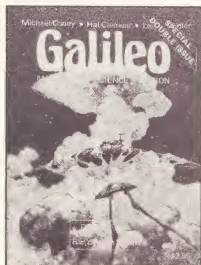
Another excellent Parker Brothers [continued on page 93]



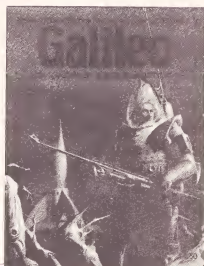
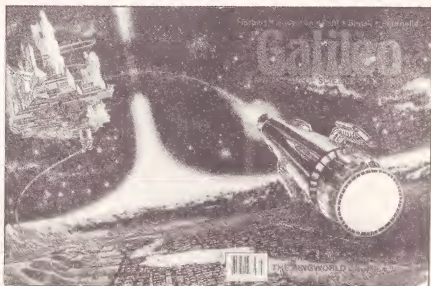
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2020...

On Film



ALIEN

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Produced by Gordon Carroll, David Giler, and Walter Hill
Screenplay by Dan O'Bannon and Ronald Shusett
Released by Twentieth Century-Fox

Reviewed by C.B. Kalish

A LIEN DRAGS YOU kicking and screaming to the very edge of your seat and holds you there to the film's last minute. While some critics have complained about the apparent paucity of characterization and the movie's derivative plot, I must admit that I was so busy closing my eyes, hiding under my seat, and being petrified that I missed any of the film's flaws. This isn't a movie with a big message. Nor is it a vehicle for the presentation of a major star personality. It's a movie with just one purpose: to terrify its audience.

Writers Dan O'Bannon and Ronald Shusett wisely avoided a complicated story line and instead opted for a rehashing of the old science fiction thriller bug-eyed-monster-attacks-hapless-humans plot. Banking on the fact that audience familiarity with such time-worn conventions as rapacious aliens and crazed robots would breed contempt and expectations for a rather silly horror film, the creative team proved that these late-movie concepts still have the capacity to terrorize us if handled properly.

Director Ridley Scott realized that proper handling required the creation of characters with whom the audience could easily identify, and special effects that would convince even the most blasé viewer that there really was an unseen horror running amok on board the space tug, *Nostromo*. Unfortunately for peo-

ple with heart trouble, Scott enlisted the warped imagination of H.R. Giger for the designs of some of the special effects of the creature and other alien artifacts. Giger's creature is horrifying in all of its various manifestations and successfully creates the illusion both of unpredictability and terrifying ugliness. By playing Giger's terrifying vision off an assembled cast of characters notable for their overall impact of being "just ordinary people," Scott produces an incredible level of tension throughout the picture as he chronicles the crew's attempts first to identify and understand the menace that has attacked them, and next to destroy it before they themselves are destroyed.

These tensions would have been impossible to maintain if the acting had not been able to support the illusion of ordinary people battling against an unstoppable menace. Fortunately each cast member managed to imbue his/her character with just enough quirks to make it a distinguishable entity while at the same time allowing for a sort of everyman identification with the audience. Sigourney Weaver is especially good as the film's spunky heroine. Although she is never spotlighted, her character is allowed a wider emotional expression and therefore wins greater audience attention. Weaver's struggles against the alien, along with the struggles of her fellow crew members, reinforce the audience's feelings that if an alien can eat nice people like Weaver and her friends, then it would probably eat the audience, too.

Alien is not a movie for everyone. Its graphic use of gore and deliberate exploitation of really deep-rooted human fears make it potentially too powerful a terror movie for many. You might be one of those people, though, who love being scared witless. If that's

the case, then *Alien* is the movie for you.

Reviewed by David Johns

HAVEN'T HAD A shot of adrenalin lately? Already missing the goosebumps that *Halloween* gave you? Search no more. *Alien* is the SF-horror film. With gaping jaws it lunges for your throat and doesn't let go for two hours. When you totter out of this film, all you'll want is a stiff shoulder to lean on, a strong drink and about three days to recover.

Ridley Scott of *The Duellists* directed. Walter Hill of *The Warriors* was one of the producers. H.R. Giger of *The Necronomicon* was concept artist for the alien and other parts of the film. With such a combination, it's no wonder that this picture is beautifully photographed in spooky dark colors with sets unlike anything you've ever seen before. Giger's truly original vision is a marked change from the usual hygienic visions of the future we're used to, where the universe seems one giant McDonald's stand.

The cast includes Tom Skerritt, Veronica Cartwright, Yaphet Kato, Harry Dean Stanton, John Hurt, Ian Holmes, Sigourney Weaver, and Jones the cat. It's a lineup of impressive, solid talent who've all given excellent performances before and do the same here. They exhibit bravery, fear, anger, and foolishness in convincing likeable characterizations.

Why, then, am I dissatisfied with this movie? Because it isn't very original. Ten years ago, about the time of 2001, science fiction made it. Since then, we've had *Star Wars*, *Close Encounters*, and other films. They've had the actors, directors, and special effects budgets of "A" films, and they've

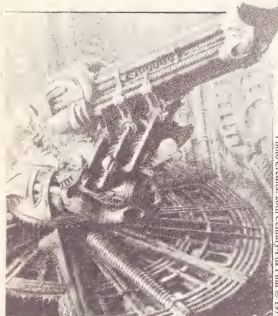


Photo Credits: 20th Century Fox Film © 1979

made money. The fact is SF is no longer a stepchild in filmdom. *Sleeping Beauty* has been kissed and awakened. Technologically, almost anything a filmmaker wants to do in an SF movie can be done. No longer does the sense of wonder include swallowing jerky animation, obvious miniatures, and people in rubber suits.

Alien, like practically all recent, major studio SF films, is good looking, well acted, and entertaining. For its entertainment value it will deservedly make money. Now maybe it's just a phase in SF filmmaking, but in becoming beautiful and successful, the capacity to dream seems to have been given up. For anyone reasonably well read in SF or general literature, *2001* was a compendium of stale philosophy, *Star Wars* was old space opera, and *Close Encounters* was simply flying saucers in a pretty package, while *Alien* is just a scary, things-that-go-bump-in-the-night story.

These films are admittedly derivative of all SF written and filmed in the last 50 years. Where or when, then, can we expect originality? Where are visions of the future that truly excite our intelligence and make the future interesting, and not simply a screen for fantasies of the past? *Things to Come* had vision, *The Day the Earth Stood Still* had a dream, the original *Invasion of the Body Snatchers* had a message, *Alien*, and other recent SF hits, have only ancestors.

Reviewed by Vincent McCaffrey

A LIEN IS THE BEST science fiction film ever made—so far beyond competition as to establish a new definition of what is best in the genre, a movie to be classed among the best in any field.

I approach this film as in an appreciation, rather than a criticism. Its faults are too few and too trivial to waste space on when so much is to be praised. The critic who constantly craves the "new special effect" will criticize its heavy use of proven device no matter how beautiful the result. The weak of stomach will disapprove of its graphic horror despite the classic context and the perfect timing of the suspense. Those who do not understand the mechanics of movie-making will not appreciate the creative ingenuity of the cinematography, set design, or, something so simple, yet so crucial, the perfect casting.

The politically minded and "message" seekers will miss the lack of rhetoric and sophomoric grand solutions. This is not a film about how you should think, yet it is the most thought-provoking of films: a movie of ideas spelled out in the elements of good storytelling and true cinematic art.

Ridley Scott's direction had brought me back to the theater several times to experience his first major work, *The Duellists*, already a cult film for its sheer beauty. Scott is a blatant romanticist in his use of the camera, a master of naturalism in his control of character, a student of Hitchcock in his timing, and an outright magician in the cutting room. (I would love a job sweeping his floor, just for the leavings.) He has made a Sci-Fi Horror Flick into a classic SF Film.

I give little credit here to authors Dan O'Bannon and Ronald Shusett, who inspired and pushed this film toward realization, because, as you will discover, the story is not the matter here. It is a good story—basic, man meets monster in the "you can't hear a scream" vacuum of space. It could easily have been a horrid rather than a horror film. Great storytelling needs a plot (did you ever hear the one about the fellow who killed his father and married his mother) but it's never the plot that makes it a great story—it's the way it's told.

Sigourney Weaver, in one fine jump, becomes one of the most important actors of her time, taking a role easily caricatured and developing it before our eyes into flesh and blood we care for. Her fellow actors pace her perfectly in smaller roles. Each, under Scott's direction, shapes a living being understood as an individual. Science fiction films so often lack a sense of full characterization that it is most often ignored by fans as not being part of the genre.

Brilliant set design must be credited to H.R. Giger and Ron Cobb; the difference in their artistic styles offers a kind of counterpoint between human and alien seldom achieved (aliens usually have very similar tastes to the

humans they encounter). Blinding lights are replaced by a sense of alien reality here. The organic is contrasted with the artificial so subtly, and so well, that when finally the one turns out to be the other, it offers a primal shock to our sensibilities.

Turning point watchers, beware: the small steps of recent years have led to a giant leap. Special effects have taken a back seat again, where they belong. This is a story about people in the future. This is science fiction the way it was meant to be.

—G—

Games

[continued from page 90]

electronic game is *Code Name: Sector*, the first "big" entry in the now-extensive electronic product category. Originally retailing for about \$50, *Code Name: Sector* is a puzzle as well as game, because one person can play (or up to four). The computer secretly picks a site on a large nautical gridded map where an imaginary submarine lurks. It is at an unknown depth (up to three possibilities) and it travels one grid point in an unknown direction every time a new player punches into the computer for a turn. Thus the player(s) must draw range lines that slowly zero in on the direction and location(s) of the sub as it moves. Eventually a "torpedo" may be commanded when a player's ship (really a punched-in set of coordinates) is in range. If the wrong depth is picked, the sub naturally "gets away". But if the "torpedo" is fired in the wrong direction, the player is "fired on," penalized by being given a new, remote location far from the sub.

In other words, the computer is the ringmaster in this battle circus. Locating the sub is a tough task, and there is even an optional "evasive action" circuit which enables the sub to change directions whenever it is unsuccessfully fired on. *Code Name: Sector* is challenging, sturdily made, runs off a nine-volt battery, and is well worth the high cost.

It may occur to some readers that a sub-search game is not precisely science fictional, but looked at abstractly, what can be more futuristic than trying to track down a computer-selected coordinate? One could paste one's own graphics over the box and just as appropriately call the grid deep space. (In fact—though the instructions do not call attention to the fact—I discovered that it's possible to steam one's ships right off the chart into hypothetical waters and reenter the grid from an unsuspected portion of the grid. This vaguely suggests spacewar and Parker might be able to adopt the idea sometime for an electronic space-battle game using basically the same computer as in *Code Name: Sector*.)

—G—

Inquisition

Letters



TO THE EDITOR,

Having just finished reading *The Adolescence of P-1*, I was anxious to read Mr. Musselman's review [in issue 11-12]. I was delighted with the book, passed on to me by a friend, and have since passed it on to others to read.

However, I take exception to Mr. Musselman's contention regarding "the novel's lack of any moral position." Shade of an absence of the three laws of robotics! If a novelist describes a villain extracting the eyes of a two-year-old, does he have to tell us it's an evil act?

Further, with regard to Musselman's contention that the "manner of P-1's demise can excite no sympathy" makes me wonder if Mr. Musselman read the last paragraph in the book.

If the mark of a "great author" is his ability to "touch as well as amuse," Ryan's last paragraph's "touch" assures him some standing.

John F. Jacobs
Charleston, IL

Dear Charlie,

As you know, I like *Galileo* very much, but I must comment upon the piece by Leslie A. Fiedler, "Who Was Olaf Stapledon," which initially appeared as the introduction to a British paperback.

First, the title of the book was *Last and First Men*, not *First and Last Men* as twice run in his piece. This is a minor point; the next point is more serious. To quote him: "In 1950, however, American criticism was not yet prepared to deal with that disreputable genre, prized chiefly by the semi-literate young. In any case, neither *First and Last Men* (1930) nor *The Star Maker* (1937) had yet been published in the United States, in part because of their anti-Americanism. Indeed, when they

did appear three years later, Stapledon's more flagrant attacks on our country and our culture had been prudently expunged." Fiedler is projecting a "critical analysis" from a fallacious premise of his own devising, rendering his conclusions accurate, when they are, only by accident.

Last and First Men was indeed published in America in 1931 by Jonathan Cape & Harrison Smith, New York.

American criticism was well prepared to deal with the book and gave it copious rave reviews in leading critical journals.

Stapledon's attacks on the United States were not expunged but were printed complete and there was a new prologue to the American edition by Stapledon in which he acknowledged his harshness towards the United States and hoped he would not prove justified.

Further in the article Fiedler states: "But SF fandom did not embrace him either, preferring authors first encountered in the specialty pulps in which Stapledon did not appear, and which indeed he regarded no more highly than did the elitist critics."

This is completely and provably false. He was regarded almost like a deity by the science fiction fans, who made his books among the most sought out items for their collections. The first important interviews with Olaf Stapledon and criticism of his works appeared in the leading fan magazines. The fan magazine, *Scientifiction*, for its issue of June, 1937, in publishing an invaluable interview and review of his newly-appeared book, *The Star Maker*, said of Stapledon that he was "rightly considered greatest of them all."

Still further on, Fiedler says of Stapledon: "Yet even at the moment when he was making headlines by declaring his allegiance to the Soviet Union in the Third World War..." I kept a file of the events while they were happening and was present when Stapledon spoke in Newark and there was no inference in the magazines, newspapers, or in his talk that could have been so construed. Where can I find the reference to such a statement?

All the foregoing is explicit in my critical and biographical article "Olaf Stapledon: Cosmic Philosopher," which first appeared in *Fantastic* for June, 1960, which was reprinted in England, which is a chapter in my book, *Explorers of the Infinite* (World, 1963), which has been in print continuously since publication and which Fiedler can find even in the Buffalo public library. He will also find in that 19-year-old essay some of the points he has made from *The Opening of the Eyes*. He undoubtedly has no knowledge of my authorized biography, "Olaf Stapledon: The Man Behind the Works," in

Fantasy Commentator for Winter, 1978, which would go a long way towards telling him who Olaf Stapledon was.

Fiedler gives 1935 as the specific date of the American Edition of *Odd John*, when it is 1936. He lists *The Opening of the Eyes* in one of his pivotal points as published in 1951 when it was published in 1954.

Sam Moskowitz
Newark, NJ

Dear Mr. Ryan,

Although David Wilson's article (*Galileo* # 11,12, "Human Powered Space Transportation") was interesting, and provided some innovative ideas, I thought the discussion of space colony recreation was quite misleading. The picture he paints of pillowy, carefree, midair collisions between bodies or vehicles is incorrect unless he intended to limit air speed to something on the order of 2 mph. This is not inferred by the rather dynamic words "swooping, hopping, soaring, bumping each other as if in Dodgem cars at a fair." Two masses which have significant closing speeds and intersecting courses really don't care if it's 0 or 5 gravities outside. $F = ma$ rules, and the collision would be similar to two people or vehicles colliding on earth with the same closing speeds, ignoring effects due to falling and contacting the ground subsequent to the initial impact. Human powered free flight in low gravity environments is one of the exciting pastimes awaiting us once orbiting or outward bound space colonies are established. Sign me up, too, Dr. Wilson, but we'll be governed by the laws of physics and, I hope, compassion when we get there.

Wade A. Horwood
Pittsburgh, PA

You're right, of course. But there is always room for a little artistic license in an article—particularly about something as poetic as free-fall flight in orbit.

—Ed.

Dear *Galileo*,

I commend Mr. Gerrold for his review of Bakshi's *Lord of the Rings*. I decided to forego the opportunity of seeing *Rings* based solely upon Bakshi's *Wizards* and that throw-away pistol climax. I had no faith whatever in his ability to do justice to Tolkien's exceptional classic.

But this letter is not intended to commend Gerrold or condemn Bakshi. This letter is intended to point out that *Rings* was not a trilogy. It only became so by editorial expediency. Any student of *Rings* and Tolkien should know this and advertise it as a service to the late Professor Tolkien and an education to the less informed.

Gary Davis
Portland, OR

Letters

Reviews

[continued from page 87]

available to a writer of this kind of tragedy that it isn't even necessary to lay out the details of the last days for the reader to accept it. So: It's several generations since the world of automobiles and condominiums collapsed, and the remaining humans have lost the ability to read or manipulate the decaying relics of that civilization. The narrator of *Engine Summer* lives in a warren founded by the League, a cooperative group that practices truthful speaking. His best friend, a young girl, goes off with Traders one year, and when he reaches young manhood he leaves the community, too, subconsciously perhaps to find her, but overtly to try to become a saint, one of those who tell true stories that teach.

Crowley has developed a whole cast of completely believable characters, from the eccentric recluse, Blink, who teaches the narrator all that he knows about the past to the strange traders of Dr. Boots, who teach him about medicines and who live without truthful speaking. The novelist has managed to pull off that most difficult of tasks: to advance the plot through the characters' speech and actions rather than narrative. The interactions of the members of the groups he finds himself in always teach the narrator something, and we move along with him, learning more about the bizarre present and obliterated past of Earth with every step of his journey.

The setting is made palpable, too: the cracked and broken Road with the cloverleaves still intact, the deserted cities and hot-dog stands that the straggling loners inhabit, the underbrush and the decaying bridges. One becomes immersed in this oddly half-familiar world and feels the breezes with the narrator.

But the real secret to this book's success is the smoothly deft style of the writer. The whole story is being told to an unknown listener, who, one quickly realizes, is one of the lost ancient humans. This listener functions as an Everyman for us, asking the pertinent questions, pulling the narrative back to its course when necessary, providing suspense. The plot dips and curves, the narrator backtracks to explicate an obscure point, or jumps ahead to mention what came out of an encounter, and somehow in all this twisting and lurching the reader is never lost. Somehow the writer is totally in control and all the loose ends are tied up, all the alien vocabulary explained, all the foreshadowed events brought to fruition. It's a highly satisfying, expertly presented, and unique tale.



Picture from "The Ringworld Engineers" by Larry Niven. Painting by Larry Blamire.

Telescope

Our future

The limitation of our use of energy is then likely to come not from the availability of energy, but from the effect of the use of this energy on Earth. This limitation suggests that space habitats may be the places for future expansions of energy use.

—Lepton Power by Gerald Feinberg

And there were the Keepers; a carefully selected group of dedicated volunteers sworn to care for the vials and the maintenance of the vorcomp. The seekers of new worlds needed the assurance that not all that was part of their heritage would be lost.

—Keeper by Jerry Goodz

The strangers moved up and down on the blue carpet. Sometimes Daisy thought she recognized them, that they were friends of her parents or people she had seen at school, but she could not be sure. They did not speak to each other in their endless, patient wanderings. They did not even seem to see each other.

—Daisy in the Sun by Connie Willis



MISSION TO MOULOKIN

by Alan Dean Foster
del Rey, \$1.95

Reviewed by David Johns

AD. FOSTER's many fans will no doubt be happy to hear that he's done a sequel to his popular novel of several years ago, *Icigger*. Once more there's action afoot in the Arizona Territory, *I mean the frozen planet of Tran-ky-ky*. Mild-mannered Easterner, *ah, human*, Ethan Frome Fortune and his faithful guide, Tonto, *I mean giant*, *Skua September*, discover that the territory's governor, *er, Resident Commissioner*, is in cahoots to cheat the settlers, *huh?* *oh, catlike natives of Tran*. They set off across the desert, *no, the ice ocean*, where they are attacked by rustlers,

oops, pirates, have a run-in with the rich rancher's son, *damnit, I mean head of a wealthy city state*, escape a herd of stampeding buffalo, *no, they're giant stanzers*, and go hunting for the lost Aztec city, *well, it's actually Moulokin which builds better ice riggers*, and so forth and so on.

There are no earthshaking discoveries in the book, no threats to the galaxy. The worst that can happen to any character is the worst that happens to most of us, to get killed or have your heart broken, and Foster makes you care in both cases. Glandularly obese Colette du Kane seems undeservedly fated to loneliness, and the triangle Ethan finds himself in with two Tran natives keeps the reader in suspense until practically the last page. Even the villains get a sympathetic nod, for beneath their skins all of Foster's characters are human and involve the reader in their problems, successes, and failures.

To top it off, Foster keeps turning out the sort of colorful and striking descriptions that make his story a technicolor thriller, like a grand old Hollywood adventure film that was black and white on the screen, and all the colors of the rainbow in everyone's memory. So enjoy this one as much as you want.

Now if he'd only write Westerns.—G—

From bazaar
to bizarre

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Star Chamber

Kate Wilhelm

KATE WILHELM started writing science fiction in 1956 after having read it for three years. She is not exclusively a science fiction author and claims that about half of what she writes can legitimately be called SF. Yet she has won both the Nebula and the Hugo, she has written at least six science fiction novels and is the author of several collections. "I am essentially lazy," she wrote to us, "and have no outside jobs or even major interests beyond writing." We would not call what she does "essentially lazy," especially since—when pressed—she admits to caring for a virtual arboretum at her home in Oregon. She likes to grow things, she says, and numbers among her charges a half dozen fruit trees, raspberries, blackberries, currants, gooseberries, grapes, blueberries, strawberries, artichokes, asparagus, rhubarb, walnuts, and a summer vegetable garden. On the other hand, she says she will not plant a grass seed or mow the lawn and she doesn't do housework. Once a year, she and her husband, Damon Knight, leave their magnificent garden to tend to the cultivation of young minds at the Clarion Writers Conference. Unlike her vegetable garden, however, budding authors are a year-round interest for her and she and her husband host them regularly with an open house which amounts to a mini-conference. Her new novel, *Juniper Time*, is scheduled for publication this summer by Harper and Row.

—G—

Classified/Star Chamber



Well, so much for our planned reign of terror.





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